The New England
Journal of Medicine

VOLUME 216 JANUARY 7, 1937 NUMBER 1

CESAREAN SECTION*

A Ten-Year Study of 703 Cases at the Boston City Hospital

BY CHRISTOPHER J. DUNCAN, M.D.,† AND JOSEPH B. DOYLE, M.D.†

THE relative merit of the various types of cesarean section is a question still much discussed by obstetricians. This is not a new question, but has been debated since Frank, in 1907, first proposed delivery through the lower uterine segment rather than the classical operation through the fundus. The discussion of this operation has been most active in this country in the past ten years during which period the obstetric service at the Boston City Hospital has grown nearly 600 per cent, from a low of 648 deliveries in 1926 to a high of 3,603 deliveries in 1933. It was felt that a study of the cesarean sections done during the ten years from January, 1926, to January, 1936, might contribute something of value to this discussion.

The Boston City Hospital service is attended by twenty-four surgeons on duty at various times throughout the year, and these operators, along with the house surgeons, who end their two-year service every three months, make a total of sixty-three operators figuring in this series. The percentage of operations performed by visiting and house surgeons is shown in table 1.

TABLE 1

	Number	Percentage
Operations by visiting surgeons	383	54.4
Operations by house surgeons	320	45.6

During the ten-year period there were 22,880 deliveries, of which 703 were abdominal sections, a 3.07 percentage (table 2). This figure has remained practically constant during the ten years of this study in spite of general reports that the incidence of cesarean section is increasing.

TABLE 2

Total number of deliveries—10 years	22,880
Total number of cesarean sections—10 years	703
Percentage of deliveries by cesarean section	3.07

There has been a definite trend toward the transverse cervical operation by most of the operators, but some still prefer the classical and others the longitudinal cervical (table 3). The choice of the type of operation was entirely at the discretion of the individual surgeon.

TABLE 3

Type of Operation	Number	Percentage of Total
Low transverse cervical	480	68.2
Longitudinal cervical	70	10.0
Low classical	114	16.2
Mid classical	7	1.0
High classical	19	2.7
Veit-Fromme-Hurst	6	0.9
Porro	7	1.0

TABLE 4

Parity	Number	Percentage of Total
Para I	205	29.16
Para II	184	26.17
Para III	122	17.35
Para IV	63	8.96
Para V	47	6.68
Para VI	24	3.41
Para VII	13	1.84
Para VIII	14	1.99
Para IX	9	1.26
Para X	6	.85
Para XI	4	.56
Para XII	4	.56
Para XIII	7	.99
Para XVI	1	.14

In reviewing the number of cesarean sections done on individual patients, it is interesting to note the tremendous difference between the mortality of primary and repeat sections (table 5).

TABLE 5

Sections	Number	Deaths	Mortality Percentage
Primary	395	27	6.8
Repeat	308	3	1.0

In this series the mortality dropped sharply from 6.8 per cent in primary cesareans to 1.0 per cent in repeat sections. This difference in

*Read at the Annual Alumni Meeting of the Boston City Hospital, May 2, 1936.

†Duncan, Christopher J.—Junior Visiting Surgeon, Gynecological and Obstetrical Service, Boston City Hospital. Doyle, Joseph B.—Assistant to Outpatients, Boston City Hospital. For records and addresses of authors see "This Week's Issue," page 32.

mortality is explained, for the most part, by the fact that most repeat sections were done electively. In the operation of choice the membranes are intact, there have been no previous vaginal examinations and the genital tract is potentially as free from infection as possible.

Reviewing the number of sections done on individual patients, it was found that 56.2 per cent of the operations in the series were primary (table 6); the remaining 43.8 per cent were done as repeat operations, one patient in the series having her eighth cesarean section.

TABLE 6

Number of Cesareans	Number	Percentage
First	395	56.2
Second	193	27.5
Third	76	10.8
Fourth	26	3.7
Fifth	10	1.4
Sixth	2	0.3
Eighth	1	0.1

The general impression has been that, with the increasing popularity of the cervical type of operation, there has been a lengthening of the number of hours permitted as a test of labor. This fact is definitely shown in our series (table 7), the average time in labor in the cervical group being almost twice that in the classical series. This seems important since it may offer a feeling of false security to many men who might allow patients to remain too long in labor without consultation. It does, however, permit of more conservative dealing with the borderline case.

TABLE 7

	Transverse Cervical	Longitudinal Cervical	Classical
Total cases	480	70	140
Cases in labor	140	28	43
Cases in labor (average hours)	15.3	16.4	8

TABLE 8

Time Membranes Ruptured	Number	Percentage of Total
Intact	590	83.7
Under 3 hours	24	3.4
3— 6 hours	23	3.3
6— 9 hours	14	2.0
9—12 hours	18	2.6
12—15 hours	6	0.9
15—18 hours	4	0.6
18—21 hours	5	0.7
21—24 hours	3	0.4
Over 24 hours	16	2.3

TABLE 9

Vaginal Examination	Number	Percentage of Total
No vaginal examination	646	91.9
One vaginal examination	52	7.4
Two vaginal examinations	5	0.7

The gross mortality in the 703 cases was 4.3 per cent, there being 30 deaths (table 10). The mortality for the transverse cervical group was 3.5 per cent, 17 deaths in 480 cases. In the low classical section there were 7 deaths in 114 cases, a mortality of 6.1 per cent, and there was 1 death in 19 high classical deliveries. The highest mortality found in this study was in the longitudinal cervical group, 5 deaths in 70 cases, a mortality of 7.1 per cent.

TABLE 10

Sections	Number	Deaths	Mortality Percentage
All cases	703	30	4.3
Transverse cervical	480	17	3.5
Longitudinal cervical	70	5	7.1
Low classical	114	7	6.1
High classical	19	1	5.3
Visiting surgeons' cases	383	16	4.7
House surgeons' cases	320	14	4.1

This, at once, would seem to indicate that the transverse cervical cesarean should be considered as the operation of choice in abdominal deliveries. A common argument against transverse cervical operation is that the procedure is technically more difficult. This is true, but the life of the patient is more important than ease of operation.

The policy of the Boston City Hospital service is to permit the house surgeon to become fully trained in all the obstetric procedures, including cesarean section, so that nearly one half the cesareans in this series were done by house surgeons under supervision of attending surgeons. This practice has worked out well (table 10). The mortality of the house surgeons was under that of the visiting surgeons, 4.1 per cent and 4.7 per cent, respectively. This can be explained by the fact that the attending surgeons elected to operate upon potentially difficult cases.

In table 11 we have listed in detail the causes of death. The mortality in this series has purposely not been corrected. It is interesting to note, however, that, if we review and eliminate certain of these fatal cases where the cause of death could not be directly attributed to the operation itself, the transverse cervical percentage would be still more favorable.

In table 12 are listed all the indications for operation. The *ratio operandi* is always much discussed in any cesarean presentation. Our

TABLE 11

DETAILED STUDY OF THE FATAL CASES

Type of Section	Membranes	Labor	Vaginal	Indication for Section	Cause of Death
Trans. cervical	Intact	None	None	Pretoxemia	Pneumonia Cardiac decom.
" "	"	"	"	Eclampsia	Shock—1 hr. p. o.
" "	"	"	"	Preeclamptic toxemia	Uremia
" "	"	11 hrs.	"	Disproportion	Peritonitis
" "	Ruptured (? time)	21 hrs.	Attempted forceps	Disproportion	Asphyxia, inhalation of vomitus
" "	Intact	None	None	Repeat	Peritonitis
" "	Ruptured, 40 hrs.	36 hrs.	One	Disproportion	Peritonitis
" "	Intact	None	None	Complete praevia	Pneumocardia, posttransfusion
" "	"	"	"	Preseparated placenta	Posttransfusion hemolysis
" "	"	"	"	Repeat	Bronchopneumonia
" "	"	"	One	Two previous stillborns	Pulmonary embolus—7 hrs. p. o.
" "	"	"	None	Previous vesico-vaginal fistula	Peritonitis
" "	"	"	"	Comp. separated placenta	Shock—30 min. p. o.
" "	"	"	"	Comp. placenta praevia	Hemorrhage—4 hrs. p. o.
" "	"	2 hrs.	"	Preeclamptic	Acute cardiac failure
" "	"	4 hrs.	"	Repeat	Pulmonary embolus—15 min. p. o.
" "	Ruptured, 1½ hrs.	24 hrs.	"	Disproportion	Peritonitis
Long. cervical	Ruptured, 8 hrs.	12 hrs.	"	Disproportion	Peritonitis
" "	Ruptured, 48 hrs.	48 hrs.	Attempted forceps (home)	Disproportion	Peritonitis
" "	Intact	8 hrs.	None	Disproportion	Peritonitis
" "	"	None	"	Placenta praevia	Bronchopneumonia
" "	"	16 hrs.	"	Separated placenta	Shock. Secondary hem.—25 min. p. o.
Low classical	"	None	"	Preeclamptic toxemia	Uremia—86 hrs. p. o.
" "	"	"	"	Complete praevia	Secondary hemorrhage—5 min p. o.
" "	? ruptured	24 hrs.	"	Prolapsed cord Fibroids	Peritonitis
" "	Intact	None	"	Complete chorea	Shock—4 hrs. p. o.
" "	"	"	"	Complete praevia	Peritonitis
" "	"	2 hrs.	"	Rheumatic cardiac	Bacterial endocarditis
" "	"	None	"	Complete praevia	Acute circulatory collapse—12 hrs. p. o.
High classical	Ruptured, 20 hrs.	9 hrs.	"	Disproportion	Pulmonary embolus—1 hr. p. o.

TABLE 12

INDICATIONS*

Type	Number	Type	Number
Repeat section	289	Disproportion	125
Premature separation of placenta	64	Previous third degree tear	10
Placenta praevia	80	Toxemia of pregnancy	29
Complete	42	Preeclamptic	28
Partial	19	Eclamptic	1
Marginal	19	Cardiacs	20
Previous stillbirths	27	Compensated	13
Vertex	13	Decompensated	7
Breech	14	Elderly primipara	6
Cervical dystocia	7	Separated symphysis	3
Transverse presentation	5	Traumatic pelvic deformity	3
Obstructing fibroid	3	Rachitic pelvis	2
Ruptured uterus (previous classical scar)	3	Uterine inertia	2
Active chorea	2	Acute rheumatic fever	1
Prolapsed cord	2	Bilateral congenital dislocated hips	1
Ankylosis of left hip	1	Elephantiasis of legs and vulva (nonfilarial)	1
Previous ruptured uterus	1	Bilateral ankylosis of hip	1
Avitaminosis (multiple neuritis)	1	Previous abscess of myometrium	1
Spontaneous rupture of uterus	1	Complete prolapse of vagina	1
Ruptured varices of broad ligament	1	Face presentation	1
Brain tumor	1	Carcinoma of cervix	1
Myomectomy (preg. 4 mos.)	1	Repair with rupture of old classical scar	1
Repaired vesicovaginal fistula	1		
Desire for sterilization	1		

*There were 7 cases in which there were two definite indications.

figures seem to be about middle road. They represent, however, the reason why twenty-four attending obstetricians elected to deliver 703 women by the abdominal route.

A major concern in reviewing any operation is the comfort of the patient and, especially in these days of economic stress, the length of hospital stay. Table 13 shows that in the cervical group the average hospital stay was 2.6 days less than in the classical group.

TABLE 13

HOSPITAL STAY

Type of Section	Number	Average Days
Transverse cervical	480	15.2
Longitudinal cervical	70	15.2
Classical	140	17.8

Table 14 (page 5) lists the complications and the percentage of the more common postoperative difficulties. Here again our figures are favorable to the cervical type of operation.

CONCLUSIONS

1. A ten-year study of cesarean section at the Boston City Hospital is presented.
2. A total of 703 cesarean sections was done in 22,880 deliveries, an incidence of 3.07 per cent.
3. There were 30 deaths in the series, a mortality of 4.3 per cent.
4. The primary section mortality was 6.8 per cent; the repeat section mortality was 1.0 per cent.
5. The transverse cervical group showed the lowest mortality, 3.5 per cent.
6. Indications for operation are presented.
7. The postoperative course was smooth and the hospital stay 2.6 days less in the cervical group.
8. From our study we feel that transverse cervical section, in spite of slightly added technical difficulties, should be considered the operation of choice in abdominal deliveries.

We are indebted to Miss Ruth T. Church, Registrar at the Boston City Hospital, for her help in obtaining data for this paper.

TABLE 14

COMPLICATIONS

	Transverse Cervical Section—480	Longitudinal Cervical Section—70	Classical Section—140
Lochiostasis	61 (12.7%)	6 (8.5%)	20 (14.7%)
Distention			
Slight	41 (8.5%)	4 (5.7%)	13 (9.2%)
Marked	12 (2.5%)	6 (8.5%)	12 (8.5%)
Extreme nausea and vomiting	3 (.8%)	3 (4.3%)	7 (5.0%)
Wound sepsis			
Major	28 (5.8%)	5 (7.1%)	7 (5.0%)
Minor	9 (2.1%)	3 (4.3%)	3 (2.1%)
Phlebitis	7	2	4
Pyelitis	4		2
Bronchopneumonia	15	2	1
Lobar pneumonia	5	1	2
Acute gastric dilation	1		
Pelvic abscess Colpotomy	3		3
Bronchitis	18	3	6
Peritonitis	1	1	
Pleurisy	1	Biliary colic 1	Subacute bacterial endocarditis 1
Evisceration	1		
Collapsed lung (right)	1		Recurrent chorea 1
Urinary fistula	2		
Syphilis	2		
Pulmonary embolus	3		
Vesicocervical abd. fistula	1	Five bladders were entered:	
Mumps	1	Recognized 4	
		Drained 3 (One died)	
Abd.-vaginal fistula	1	Not drained 1	
		Not drained	
Multiple neuritis	1	or recognized 1	

TRICHINELLA ANTIGEN: FURTHER OBSERVATIONS ON ITS USE IN THE DIAGNOSIS OF TRICHINOSIS*

BY WESLEY W. SPINK, M.D.†

BIOLOGIC extracts for skin tests and serologic reactions are widely used as aids in the diagnosis of many diseases. Among these, the extract prepared from *Trichinella spiralis* has been helpful in the diagnosis of suspected and atypical cases of trichinosis. The first to use this antigen for diagnostic purposes was Bachman[1, 2, 3] in 1928. His observations were made upon trichinous animals. It remained for Augustine and Theiler[4] to evaluate the application of these tests in infected human beings and animals. They concluded that the skin test and precipitin reaction are of specific value in the diagnosis of trichinosis in man and swine. Many reports have appeared confirming their results.[5-12]

In 1935, Spink and Augustine[13] reported the results of skin and precipitin tests in 35 patients with trichinosis. Twenty-five more cases have been observed since that report, making a total of 60 cases. Skin tests were done on all the patients, and the precipitin test on blood serum was carried out in 35 patients. It is desirable at this time to call attention to two types of skin reactions that are obtained with the trichinella antigen. The recognition of an immediate and a delayed type of skin reaction occurring in different stages of the disease increases the usefulness of the skin test. The appearance of these two types of skin reactions in relation to the precipitin test will also be pointed out.

*From the Thorndike Memorial Laboratory, Second and Fourth Medical Services (Harvard), Boston City Hospital, and the Department of Medicine, Harvard Medical School, Boston, Mass.

†Spink, Wesley W.—Resident Physician, Thorndike Memorial Laboratory, Boston City Hospital. For record and address of author see "This Week's Issue," page 32.

METHOD OF PREPARING ANTIGEN FOR SKIN AND PRECIPITIN TESTS

The method of preparation in these experiments is a slight modification of the original Bachman method.[1] At present there is no commercial preparation of the antigen on the market. Bachman stated that his extract retained its potency for 3 to 4 weeks, if kept in the icebox. We have found that the potency of the antigen is maintained for as long as 12 months. If the powdered trichinella larvae are kept in the icebox and the saline extract of this protein is made up as needed in small lots, the potency may be retained for several years.

Guinea pigs are fed meat containing encysted *Trichinella spiralis*. After 30 days, when the parasites have become localized in the animals' muscles, the pigs are killed, eviscerated and skinned. The muscles are ground up with a fine meat chopper and then digested in an aqueous solution of 0.4 per cent pepsin and 0.3 per cent hydrochloric acid. Large glass containers with this solution and muscle are placed in an incubator at 38° C. for 15 hours, and the contents stirred at frequent intervals. At the end of this time, the larvae are free and alive. The solution is then passed through a 16-per-inch wire mesh and then a 40-per-inch mesh to remove the particles of undigested meat and bones. The larvae are allowed to settle to the bottom of the jars, and the supernatant fluid is carried off by means of a siphon. The parasites are repeatedly washed with tap water in this manner until the washings are clear. The larvae are allowed to form a sediment in smaller jars. They are finally collected in a small porcelain dish and dried in the incubator at 38° C. The dried larvae are placed in ether for 24 hours, then put in a vacuum over sulfuric acid for another 24 hours. At this time the larvae are pulverized in a small agate mortar and extracted with Coca's solution (NaCl 0.7 per cent, $NaHCO_3$ 0.05 per cent and carbolic acid 0.4 per cent in distilled water). After 3 days of extraction, the solution is passed through a No. 3 Seitz filter. The clear solution containing the extracted protein is then put in sterile glass containers, which are closed with rubber stoppers capable of being easily perforated by a hypodermic needle.

SKIN REACTIONS WITH TRICHINELLA ANTIGEN

During the past 4 years, observations of the skin and precipitin tests have been carried out on 60 patients with trichinosis. Skin tests were done on all of these patients. Fifty-nine of the 60 tests gave positive reactions. The negative reaction was elicited in a patient in a moribund condition due to trichinosis. Postmortem examination of the patient's muscles showed them to be heavily infiltrated with *Trichinella spiralis*.

The method of doing the skin test is, briefly, as follows: 0.1 cc. of a 1:10,000 dilution in Coca's solution of the trichinella antigen is injected intradermally into the flexor surface of the forearm and the same amount of Coca's solution, the diluent of the antigen, is injected into the other arm. In describing the reaction that follows, it was previously stated[13] that the reaction was of the *immediate* type. However, an immediate or a delayed type of skin reaction may result, depending upon the duration of illness.

The *immediate* type of skin reaction usually is not obtained until the second week of the infection. Within 5 minutes after the injection, a blanched wheal appears, sometimes with pseudopodia running out from it. There is a pronounced area of erythema surrounding the wheal. The reaction usually reaches its maximum in 1 hour, then gradually subsides. In 54 of the 59 patients giving a positive skin test, the reaction was of the immediate type. This type of skin response may be elicited months and years after the acute illness has subsided.[14]

The *delayed* type of skin reaction was observed in 5 of the 59 patients with positive skin tests. Following the intradermal injection of the antigen and the control solution, there is an erythematous flare, which subsides quickly. Then, in 12 to 24 hours, at the site of the injection of the antigen, there is a reddened, slightly edematous and tender area from 1 to 3 centimeters in diameter. Reaching its maximum within 18 to 24 hours, the reaction gradually subsides over a period of several days. This type of skin reaction is elicited only early in the disease. In the 5 patients seen early enough in the course of their illness to obtain a delayed type of skin reaction, the response was of the immediate type by the seventeenth day of their illness.

Chart 1 illustrates the types of skin reactions obtained in a patient first seen on the third day of his illness. The outstanding clinical features at this time were edema of the eyes, and fever. On the fourth day, the skin reaction was of the delayed type. One week later, on the eleventh day of his illness, the reaction to the intradermal injection of antigen was still delayed, but occurred 12 hours after the injection of antigen instead of 24 hours. On the seventeenth day of his illness, the reaction was of the immediate type.

Chart 2 illustrates the case of a young woman first seen in the second day of her illness complaining of edema of the eyes, marked prostration and fever. The skin test on the fourth day was of the delayed type, and on the tenth day was of the immediate type. Precipitins were present as early as the fourteenth day of her illness.

Early in the course of trichinosis, therefore, the skin reaction to the intradermal injection of trichinella antigen is of the delayed type. During the second week of the patient's illness, the skin reaction is of the immediate type.

The precipitin test for trichinosis was per-

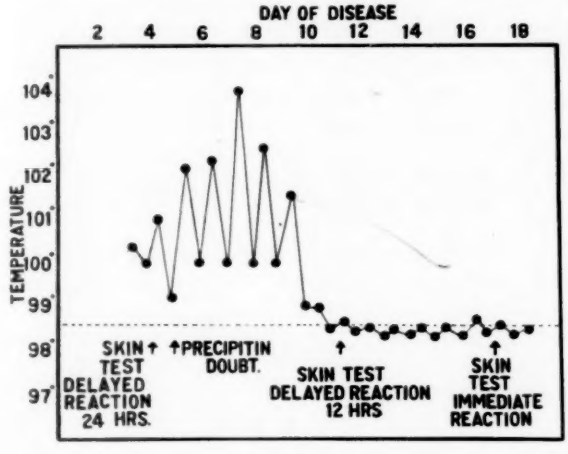
DAY OF DISEASE
2 4 6 8 10 12 14 16 18
TEMPERATURE
104° 103° 102° 101° 100° 99° 98° 97°
SKIN TEST DELAYED REACTION 24 HRS.
PRECIPITIN DOUBT.
SKIN TEST DELAYED REACTION 12 HRS
SKIN TEST IMMEDIATE REACTION

CHART 1.

Daily temperature of patient with trichinosis with results of skin and precipitin tests. Patient first seen on third day of illness.

formed on the serums of 35 of the 60 patients, and all gave positive reactions. The test is done by overlaying 0.3 cc. of the patient's clear

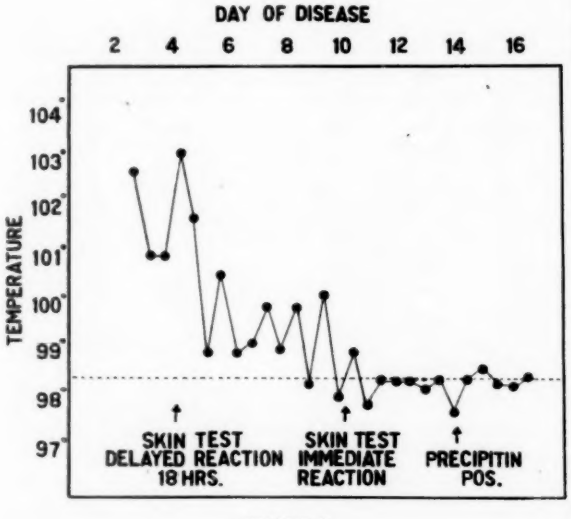
DAY OF DISEASE
2 4 6 8 10 12 14 16
TEMPERATURE
104° 103° 102° 101° 100° 99° 98° 97°
SKIN TEST DELAYED REACTION 18 HRS.
SKIN TEST IMMEDIATE REACTION
PRECIPITIN POS.

CHART 2.

Daily temperature of patient with trichinosis with results of skin and precipitin tests. Patient first seen on second day of illness.

serum in a small tube with an equal amount of a 1:100 dilution of trichinella antigen. A control tube contains 0.3 cc. of the patient's serum overlaid with Coca's solution. The tubes are placed in a water bath at 37.5°C. for 1 hour. A positive test shows a white ring at the junction of the serum and antigen. Precipitins usually do not appear until the fourth week of the disease, but they may be demonstrated as early as the second week (chart 2).

DISCUSSION

Confusion has arisen in the interpretation of skin reactions in the hypersensitive state because various workers have used different animal species. It is well recognized that the tissue response to foreign protein varies with the species used for study. The use of intradermal injections of trichinella antigen in the diagnosis of trichinosis has been misunderstood by some because of the failure to recognize that the course of the reaction in man differs from that of lower animals. The primary interest in the present study has been to point out the types of skin reactions in human beings infected with *Trichinella spiralis*.

In describing the skin reaction to trichinella antigen, Bachman used trichinous rabbits.[2] Observations were made every 1, 5, 12, 24 and 48 hours. He tabulated the observations of the 12-hour readings. In other words, the reaction in the rabbit is the delayed type, in contrast to the usual immediate type observed in man by subsequent workers. The course of the reaction in the rabbit is marked by edema, which is practically absent in man. Furthermore, Bachman stated that skin reactions appeared as early as the second day after infection. However, he stated that since the animals had had a preliminary skin test with a relatively concentrated suspension of the antigen (1 per cent) before being infected, this injection may have caused a local hypersensitivity and "it is probably safer to conclude that typical skin reactions appear within the first week after infection."

Augustine and Theiler[4] repeated the experiments of Bachman and also made extensive observations in man. They concluded that, in both rabbits and guinea pigs, the reaction is that of the delayed type. The course of the reaction differs considerably from that of man, principally due to the presence of a marked edema. The earliest positive skin reaction in infected guinea pigs occurred on the ninth day, while the earliest in the rabbits was on the fifth day. They state further that noninfected animals may be rendered hypersensitive by repeated skin tests with trichinella antigen and, in their belief, this accounted for the earlier positive reactions in some of Bachman's animals.

Further observations by Spink and Augustine[13] showed that the immediate type of skin reaction in trichinous patients was elicited on or about the seventeenth day following infection, while precipitins could be demonstrated during or after the fourth week of the disease.

The present observation that patients hypersensitive to trichinella protein may show first a delayed type of reaction and then an immediate reaction is in accord with studies carried out by other workers. Mote and Jones,[15, 16]

sensitized rheumatic fever patients with a foreign protein intracutaneously using the peritoneal fluid of rabbits. The first manifestation of this induced sensitivity was a delayed, 24-hour type of skin reaction. After a lapse of time, only the immediate type of reaction could be elicited, using the same skin testing material. Circulating antibodies were never demonstrated during the stage of delayed type of reaction, while they were found in some of the patients having the immediate type of reaction. The skin sensitivity was lost in the reverse order of its appearance, the immediate wheal being replaced by the 24-hour reaction, and this in turn became negative. It is to be noted that the fundamental difference between our observation and that of these workers is that, once a patient has trichinosis, months and years later the skin response to trichinella antigen is positive and of the immediate type. This difference may be due to the amount or type of material with which an individual is sensitized.

Simon and Rackemann[17, 18] succeeded in sensitizing normal and atopic persons to guinea pig serum by both the intracutaneous and intranasal administration of the antigen. They observed the same type of skin response, the sensitivity manifesting itself first with the delayed type of reaction, and then the immediate.

Dienes[19] observed that, when guinea pigs were given injections of a few milligrams of egg white or horse serum, they showed positive cutaneous reactions on the fourth day after injection. These reactions were similar to reactions to tuberculin developing several hours after intracutaneous injection and persisted for 2 days or longer. Later on, the cutaneous reactions were immediate, precipitins appeared, and anaphylactic shock was obtained. In passively sensitized animals, skin reactions were never delayed.

As far as is known, trichinosis is the only infectious disease where a delayed cutaneous reaction is followed in a short interval by an immediate type of response with the use of the same skin testing material. A possible exception to this statement is found in the work of Finland and Dowling,[20] who studied the cutaneous reactions in patients with pneumococcus infections by using different carbohydrate fractions of the pneumococcus. They observed that an immediate cutaneous reaction to the type-specific soluble substance took place only in individuals *after recovery* from a pneumococcus infection. But a delayed type of response was elicited *during the acute stage of the illness* if the non-type-specific cellular "C" substance were used, and no reaction took place after recovery. Therefore, in skin testing pneumonia patients, an immediate or delayed reaction might be elicited, depending upon the stage of the disease, if a combined carbohydrate fraction were included in the antigen. It may be possible that in trichinosis the reactions occurring at different stages of the disease are due to more than one antigenic fraction being present in the crudely extracted trichinella antigen.

Although the phenomenon of two types of skin reactions herein described is little understood, it appears to have a useful application in the diagnosis of trichinosis.

SUMMARY

1. The method is outlined for preparing trichinella antigen for diagnostic skin and precipitin tests in trichinosis.

2. On the basis of 4 years' experience, it is recommended that these tests be utilized routinely as aids in the diagnosis of doubtful cases of trichinosis.

3. During the first few days after infection, the skin reaction may be of the delayed, tuberculin type. At the beginning or during the second week after infection, the reaction to intracutaneous trichinella antigen is of the immediate type.

4. Precipitins appear in the blood as early as the second week after infection, but usually during the fourth week.

5. The significance of these two types of skin reaction is discussed.

REFERENCES

1. Bachman, G. W.: A precipitin test in experimental trichiniasis. J. Prev. Med. **2**:35 (Jan.) 1928.
2. Bachman, G. W.: An intradermal reaction in experimental trichiniasis; preliminary report. J. Prev. Med. **2**:169 (March) 1928.
3. Bachman, G. W.: An intradermal reaction in experimental trichiniasis. J. Prev. Med. **2**:513 (Nov.) 1928.
4. Augustine, D. L., and Theiler, H.: Precipitin and skin tests as aids in diagnosing trichinosis. Parasitology **24**:60 (March) 1932.
5. Hunter, G. W.: Human Trichinella spiralis infections and the Bachman precipitin test. Am. J. Hyg. **13**:311 (Jan.) 1931.
6. Swineford, Oscar, Jr., and Waddell, W. W., Jr.: Trichiniasis—five cases in one family—with results of skin tests. Virginia Med. Monthly **59**:28 (April) 1932.
7. McCoy, O. R.; Miller, J. J., Jr., and Friedlander, R. D.: The use of an intradermal test in the diagnosis of trichiniasis. J. Immunol. **24**:1 (Jan.) 1933.
8. Maternowska, I.: Intradermale Hautreaktion bei Trichinose. Zentralbl. f. Bakt. **129**:284 (Aug.) 1933.
9. Friedlander, R. D.: The present status of the diagnostic intradermal test for human trichiniasis. Am. J. M. Sc. **188**:121 (July) 1934.
10. Sobel, I. P.: Sporadic trichinosis in children. Am. J. Dis. Child. **51**:367 (Feb.) 1936.
11. Goldschlager, A. I.: Trichinosis; a report of 8 cases with skin and precipitin tests. Ann. Int. Med. **8**:939 (Feb.) 1935.
12. Drake, E. H.; Hawkes, R. S., and Warren, M.: An epidemic of trichinosis in Maine. J. A. M. A. **105**:1340 (Oct. 26) 1935.
13. Spink, W. W., and Augustine, D. L.: The diagnosis of trichinosis with especial reference to skin and precipitin tests. J. A. M. A. **104**:1801 (May 18) 1935.
14. Theiler, H.; Augustine, D. L., and Spink, W. W.: On the persistence of eosinophilia, and on immune reactions in human trichinosis, several years after recovery. Parasitol. **27**:345 (July) 1935.
15. Jones, T. D., and Mote, J. R.: The phases of foreign protein sensitization in human beings. New Eng. J. Med. **210**:120 (Jan. 18) 1934.
16. Mote, J. R., and Jones, T. D.: The development of foreign protein sensitization in human beings. J. Immunol. **30**:149 (Feb.) 1936.
17. Simon, F. A., and Rackemann, F. M.: The development of hypersensitiveness in man following intradermal injection of antigen. J. Allergy **5**:439 (July) 1934.
18. Simon, F. A., and Rackemann, F. M.: The development of hypersensitiveness in man; absorption of the antigen through the nasal mucous membrane. J. Allergy **5**:451 (July) 1934.
19. Dienes, L.: The specific immunity response and the healing of infectious diseases; significance of active immunity and connections between immunity response and anatomic lesions. Arch. Path. **21**:357 (March) 1936.
20. Finland, M., and Dowling, H. F.: Cutaneous reactions and antibody response to intracutaneous injections of pneumococcus polysaccharides. J. Immunol. **29**:285 (Oct.) 1935.

PSYCHIATRIC WORK IN THE HYGIENE DEPARTMENT OF HARVARD UNIVERSITY

BY KENNETH J. TILLOTSON, M.D.*

DURING the past academic year, 1935 and 1936, with the reorganization of the Department of Hygiene of Harvard University, the mental hygiene or psychiatric aspects of the medical problems presented by the students have been studied in a first approximation with the following objectives in mind. The first was to assist students who had mental symptoms, personality difficulties, incipient neuroses and even well-developed psychoses in obtaining proper psychiatric and medical advice; the second was to place psychiatrists within easy access of the medical staff of the department so that they would be readily available to the physicians and students for consultation, as well as to the deans and faculty; and the third was to study from a psychiatric point of view the needs and requirements of the department, having in mind the welfare of the student body and the University, and to outline what kind of psychiatric work should be carried on in order to find out the types of mental disturbances which can and should properly be handled within the department and the types that unquestionably would render the student unsatisfactory for further academic work in the University. In this connection there are several research problems that at once present themselves. At least one of these will be referred to later in this report.

So far there has not been any systematic psychiatric examination made of any group of students except those who, with well-marked emotional problems or mental symptoms, have been referred to the psychiatrists for special examinations and study. Some of these students have come voluntarily for such examinations, while others have been referred by the deans or other faculty members or, more often, by the internists or surgeons attached to the hygiene department staff. The results of our first year's work indicate that the mental hygiene needs and aspects of the medical work constitute not only a considerable part, but an exceedingly important phase, of the hygiene work. So far our experience checks very closely with the studies and the results that have been found in other universities, such as Yale, Dartmouth and Michigan. The nature and seriousness of many of the individual problems, that is, the mental conditions of the students seen, as well as the frequency with which personality difficulties and emotional upsets causing mental symptoms are met with in a large number of students, indicate at once that further studies and research should be made.

From the standpoint of care and treatment of the student body during the past academic year, four consulting psychiatrists have been attached to the department who have given regular hours for consultations and work with students. These psychiatrists have been available for emergency calls at all times.

During the past year there have been a number of major psychoses together with a larger number of neuroses and the so-called milder or borderline psychoneurotic conditions observed and studied in students coming to this department. Among the major psychoses there have been twelve cases diagnosed as schizophrenia, six of which required hospitalization. There have been twenty-two students with manic-depressive psychoses, of whom four required hospitalization. One case of epilepsy, thirty-three students who were recorded as subject to psychoneuroses or neuroses and twelve students with constitutional psychopathic inferiority personality were seen, and thirty-eight students were studied without any formal diagnosis being made whose presenting symptoms, in some instances, were of a serious nature. In this latter group there were four students who had attempted suicide and three of these required hospitalization. There were nine other consultations. The latter group consisted of students who were seen in the infirmary or seen in connection with some misdemeanor or irregularity in connection with their conduct in the University. The total number of students seen in the clinic was 127 and the total number of visits to the psychiatrists was 376. Most of the students who required hospitalization were referred to McLean Hospital, as certain members of the staff of the McLean Hospital, at the request of Dr. Bock, had been assisting in the psychiatric work of the department. Several of the students have made excellent recoveries and will be able to continue their academic work, while, in other instances, the psychoses or mental symptoms are already so far advanced that little, if anything, can be done for their recovery. In this connection it is quite apparent that parents frequently permit their sons to come to Harvard University fully realizing that they are mentally ill. For instance, one boy, who came to the clinic because of a head cold, in the course of the examination was discovered to be suffering from a serious mental illness. In fact, he told the physician he had been con-

*Tillotson, Kenneth J.—Psychiatrist-in-Chief, McLean Hospital. For record and address of author see "This Week's Issue," page 32.

templating suicide at times but, at first, felt that he must take the life of a fellow student. His plan for homicide as well as his suicidal intent was, of course, based upon delusions. The student was hospitalized and was found to be suffering from advanced symptoms of schizophrenia. As we have so often found, the mother of this patient said that she knew her son had been ill. He had failed to adjust himself at a small western college (for obvious reasons), but it was felt that "Harvard would straighten him out".

Generally speaking, we feel that students suffering from conditions requiring psychiatric treatment, that is, necessitating frequent visits to the psychiatrists over a long period of time, should withdraw from the University. There are, to be sure, milder personality and adjustment problems which can be properly treated in the hygiene department or under competent psychiatrists in this vicinity, thus permitting these students to remain in the University. A large number of students with personality and emotional problems and psychoneuroses have been successfully treated in the hygiene department. There have been a number of students with adjustment difficulties who have received help in a discussion of their scholastic and environmental problems, as well as in the investigation and treatment of their medical and personality difficulties. These men have been helped to the extent that their emotional symptoms cleared up and they became well-adjusted individuals. We are quite certain that major psychoses and some types of psychoneuroses should not be handled or treated under conditions allowing the students to remain in the University. This does not apply to the questionable cases where suicidal, homicidal or homosexual tendencies are the outstanding symptoms, but it applies to students whose presenting symptomatology is such that they need more personal supervision than can be given in university dormitory life and to students who, because of their psychopathologic manifestations, cannot profit from academic pursuits. The latter may be a liability to the University as well as to themselves.

Many students have told me that their symptoms began when they were quite young and, in some instances, their physicians, but more often their parents, have felt that college life would cure them of their personality and emotional difficulties and their mental symptoms. Many of the students of the manic-depressive type have suffered from periodic depressions and elations or mild excitements and have contemplated, and in some instances attempted, suicide before coming to college. Some of the less marked psychotic complaints have been fears created through failures to make a satisfactory adjustment in the University, many of the younger students stating that they have become worried and unable to sleep and to concentrate during these stress periods. A number of students in coming to the writer have formulated their chief complaint by saying "I hardly know what is wrong, but I fear Harvard." Some find it difficult to emancipate from their home environment, while others present more difficult problems, such as adolescent problems of sexual adjustment, often manifest in varying degrees of homosexual and heterosexual problems. Some are inclined to drink too much, attempting to sublimate their neurotic and emotional problems by the use of alcohol.

In a large student body such as Harvard, comprising about 8,000 students, on the basis of such statistics as are available, one would expect, and with some degree of certainty could predict, not 127 cases of mental and personality disorders but approximately 800 suffering from definite mental symptoms. The general experience of the Department of Hygiene suggests the presence, in such a group, of an additional 10 per cent having difficulties of a mental nature likely to profit by means of a personality survey. There is a question as to how far we should go in more adequately meeting the psychiatric needs. In some universities, routine psychiatric examinations of all students have been attempted. Other colleges are carrying through routine psychiatric examinations of all freshmen. For various reasons we have felt that this was not advisable. We do feel, however, that where there is any question or where the personality problems and difficulties are causing obvious embarrassment there should be a psychiatric check-up of the student, not on the basis of what might be found, as the case would be in a routine examination, but on the basis of what is already manifest in the way of presenting symptoms. We feel also that certain graduate and certain special fellowship students should, in most cases, have a thorough routine psychiatric examination.

In addition to the clinical work and to the preventive and therapeutic aspects of a mental hygiene type already taking place in the hygiene department, this department offers an unusual opportunity for work on several important research projects in connection with personality studies, not only in a group of students suffering from symptoms of a psychopathologic character but including a careful sociologic study, known to be an important part of the psychologic components found in all of these students. Family problems and domestic situations, especially if the parents are separated or divorced, invariably create or contribute toward severe and serious emotional

symptoms. We have found the parental situation a matter of great influence and worry to a considerable number of neurotic students. Economic factors, as well as genetic factors, enter into the development of the personality disorders of all the students that we have studied. An experimental group of students who are apparently well adjusted and free from pathologic symptoms, the so-called well adjusted group of students, should be studied from the same psychiatric and sociologic standpoints. This would offer the basis of a comparative study of the relative factors involved. With the facts thus obtained we would be better prepared to set up standards of personality types as well as of the controlling etiologic factors that tend to produce or aggravate emotional disturbances and mental symptoms. This would be of great value in our psychiatric work. To do this, in addition to the regular clinical psychiatrists now attached to the department as consultants on a part-time basis, one or two full-time psychiatrists, assisted by one or more psychologists, together with social service workers, would be required.

It is quite probable that with the new types of physical examinations that include a consideration of the personality characteristics and the more obvious nervous and mental symptoms of the students, the psychiatric requirements of this department will increase so that very soon two full-time psychiatrists will be required.

In 1931 the First National Conference on College Hygiene was held at Syracuse University under the sponsorship of the President's committee of fifty on college hygiene. The mental hygiene or psychiatric aspects of college and university hygiene work occupied a position of some importance at this conference. It is interesting to note that the Second National Conference on College Hygiene was held in Washington, D. C., in December, 1936, and that the mental hygiene aspects of university hygiene work received much more attention. It is the feeling of the writer that there has been a notable lack of research into the fundamental problems that confront us daily in this particular phase of psychiatric work.

It seems reasonable to suppose that, until more research is carried out, our clinical work will continue to be empiric and crude. We shall continue in a more or less inadequate and blundering fashion with our impressions and speculations, without the scientific knowledge and helpful guidance that can come only through determining the exact nature of the facts and factors involved on a logicoexperimental basis. To be sure, each student in every instance constitutes an individual study. However, certain researches leading to a careful investigation of a large number of the well-adjusted students as well as the neurotic and psychotic students will yield variables and constants in the form of common factors centering about environmental influences, genetic components and personality characterizations, which will serve as valuable and important guides in our work with all students, not alone from a medical and psychiatric point of view but from the standpoint of sifting out, at an early period in the college course, those students who cannot profit by academic training. We already have data and case histories to show that most cases of psychoses have progressed while the students were pursuing their college work. Most of the cases of psychoses were found in upper classmen, juniors and seniors, and, in most instances, these conditions could unquestionably have been recognized and diagnosed during the freshman year, if a more careful examination had been given with psychiatric considerations in the foreground.

The injustice to students under the above conditions, that is, to those who go on in their college work suffering from neuroses and psychoses and eventually break down in their junior and senior years, as well as the loss to the University, is worthy of a great deal of serious consideration. These and many other problems offer a challenge for further careful research and clinical studies of a psychiatric nature in this department.

GENTIAN VIOLET TREATMENT OF LEG ULCERS*

Preliminary Report

BY FRANCIS M. THURMON, M.D.,† AND HARRY CHAIMSON, M.D.†

THE obstinate refractiveness of chronic leg ulcers frequently presents an annoying and at times difficult problem in medicine. The factors responsible for these resistant ulcerations are many. Local loss of vascular balance is usually considered to play an important part in the etiologic background. Systemic disease, trophic disturbances and gravitational or circulatory disorders are of frequent causative occurrence. Trauma, local loss of tissue substance from scarring, phlebitis, varicosities, anemia, cardiorenal disease, myxedema and interference with lymphatic drainage are entities which occasionally produce nutritional imbalance and loss of vascular tone. Irrespective of etiology,

*From the Clinic of Dermatology and Syphilology, and the Division of Research of the Boston Dispensary.

†Thurmon, Francis M.—Physician-in-Chief, Clinic of Dermatology and Syphilology, The Boston Dispensary. Chaimson, Harry—Assistant in Dermatology, The Boston Dispensary. For records and addresses of authors see "This Week's Issue," page 32.

there is one persistent factor common to all leg ulcerations and that is the secondary bacterial invasion. The infection delays healing.

In consideration of the above facts, any therapeutic measure that may be proposed should aim not only at correcting an impaired vascular balance, but should also possess bactericidal properties and an ability to control excessive granulation and, at the same time, should not injure the tissue cells. Gentian violet in 2 per cent aqueous solution is an agent possessing these qualities. The use of this type and strength of solution as a topical application in 15 patients with chronic leg ulcers forms the basis of the present communication.

This study was started January 11, 1934. Its continuation was encouraged by the report of Krinsky,[1] who cited favorable results within 4 to 7 weeks in leg ulcers when "5 per cent" gentian violet solution was used as a local application. The strength of his solution is a little difficult to understand, since pure gentian violet crystals form a saturated solution in 2 per cent concentration.

HISTOPATHOLOGIC CLASSIFICATION OF ULCERS

The clearest histologic description of ulcers is that of Unna.[2] Since certain phases of Unna's description form the basis of our concept of this problem, they will bear repetition. In substance he states, "Ulceration is granulation tissue hindered in its typical involution."

Normal healing of any loss of tissue substance depends upon the correlation of the following three distinct histologic factors: (1) the budding of young capillaries with the transformation of connective tissue into cellular granulation tissue; (2) new growth of the surrounding epithelium with the formation of epithelial ridges and union of the epithelium to connective tissue; (3) secondary shrinking of the vessels with the formation of collagenous substance in the place of granulation tissue. If there is any interference with one or more of these factors (be it endogenous, as a constitutional disturbance, or exogenous, as a local bacterial invasion, or both), the otherwise favorable condition of healing gives way to the origin or formation of ulcer.

From the clinical and histologic point of view five main types of leg ulcers are encountered in the bulk of clinic cases. Briefly, they are recognized as follows:

Hypertrophic Ulcer: The failure of the epithelium to cover the gap in hypertrophic ulceration is due to an overabundant formation of granulation tissue. The granulations grow so fast that the epithelium cannot cope with them. They project above the level of the skin and sometimes overlap the cutaneous margins, and the epithelium, instead of being able to cover the granulations and depress them, cuts into their edges thus preventing the ulcer from healing.

Cornified Ulcer: This is the commonest form of leg ulcer. The calloused, hard and thick appearance of the cornified ulcer is due to cornified epithelium. A horny ring, movable, but without any tendency to healing, encircles the smooth white greyish ulcer. In this type the prickle cells form a cornified ridge around the edge of the ulcer which binds down and draws the newly formed epithelial cells into the cutis, thus preventing the epithelium from spreading out to cover the ulcer.

Anemic Ulcer: The anemic ulcer, although similar to the cornified, is flatter and appears dried up. It develops from a deficient blood supply more frequently than from a systemic disturbance. The walls are smooth and hard, the edges are never overhanging and the base is covered with a very thin layer of granulation. The exudate is slight; the base is dry, reddish-grey or even white, and is insensitive. The deficient blood supply delays healing by interfering with the growth of epithelial cells, mechanically hindering the advance of epithelium by drying, and leads to the premature formation of collagen in the granulation.

Hemorrhagic Ulcer: The hemorrhagic ulcer frequently results from varicose veins. Many varicose ulcers develop from the hemorrhagic type but usually, through the predominance of one of the three factors of healing, are transformed into one of the other types of ulcer. The hemorrhagic ulcer is bluish-red to blackish-brown, with shallow or deep loss of substance. The scanty granulations are permeated by small hemorrhages or filled with blood like a sponge. At their base the varicose vein lies more or less exposed. Marginal cornification is either absent or may descend to the insufficiently developed granulations. At best there is a thin, fragile, breaking-down scar, provided the granulations have not previously altered the picture. Usually a defined area of total necrosis of the skin overlying the varix imparts a punched-out appearance to the smaller ulcer, while the larger ones show polycyclical forms.

Edematous Ulcer: The edematous ulcer, in contrast to the hypertrophic type, is less firm and vascular. It is found along with general or local edema of the neighboring tissues and is distinguished by pale, transparent, moist, soft, spongy granulations projecting above the level of the skin and by an inactive epithelial border. Partial edema of the granulations is frequent. This is not remarkable since most of these ulcers are due to stagnatory or hypostatic hyperemia.

DATA

The 15 patients with chronic leg ulcers were considered interesting because of the long duration of their lesions necessitating years of treatment without recovery, and also because of their comparatively rapid and successful response to the treatment herein described.

There were 7 males and 8 females. Their lesions ranged from 1 to 20 years' duration. The known gamut of therapy had been applied which, in some instances, comprised ultraviolet radiation, rest in bed, Unna's plaster, intravenous sclerosing solutions, pressure dressings and various local applications, such as mercurochrome, scarlet red, zinc oxide, ichthyol, ergophene and hexylresorcinol.

With the exception of the edematous type of ulceration, treatment with 2 per cent aqueous gentian violet solution resulted in progressive healing. A definite sequence of characteristic results was observed. Pain and irritation materially subsided after the third or fourth application and usually disappeared after the first 2 or 3 days. Similarly the exudate from secondary infection was controlled within a short period of time. Once a firm, dry, adherent crust had formed no reinfection occurred, since the film of gentian violet served as a protective covering. Epithelialization took place satisfactorily, as was observed by the occasional removal of a portion of the crust to see what was taking place. Complete healing of all ulcers occurred within 8 weeks to 7 months. The resulting scars were thin and flexible and in some instances difficult to distinguish from the surrounding normal skin.

With the edematous ulcers the results were unsuccessful until the edema was brought under control. Topical application of gentian violet during the edematous stage was ineffective, since the stain was diluted or completely washed away by the serous exudate. Whenever it was possible to control the local and surrounding edema, the gentian violet treatment was of definite aid in hastening healing.

TECHNIC OF APPLICATION

A 2 per cent aqueous solution of aqueous gentian violet* was used on all cases. A topical application of the solution was applied three to five times the first day, the patient being instructed to repeat this procedure through the following 2 or 3 days, or until a hard, firm, dry, adherent crust had formed. With each application the solution was permitted to air-dry and at no time were the ulcers bandaged.

As long as the violet-stained crust remained firm, dry and adherent it was not disturbed. Should any portion of the crust become loose or pocketed, that portion of the crust was removed with sterile forceps and scissors, the ulceration cleansed with dry sterile gauze and gentian violet reapplied as previously directed or until a new dry crust had formed. Loosening of the crust or pocketing beneath it is usually due to a collection of thin grey purulent material beneath the crust.

During the entire period of treatment each patient remained ambulatory.

*Aniline violet—Gentian violet B (Merck).

CASE REPORTS

The following five case reports are brief abstracts illustrative of each type of ulceration classified above. They are representative examples of the 15 patients included in this report.

CASE 1.—L. P., a married Polish woman, aged 52 years, entered the Skin Clinic August 31, 1933, with a history of recurring painful ulcers over both legs, ankles and feet for the past 18 years. Examination revealed multiple ulcerations of varying size and shape, some irregular, others circular, along the dorsum of the left foot, the lateral aspect of the right foot, anterior to the external malleolus, and over the lower portion of each leg. A few of the ulcers had a greyish base and scant granulation. Those of the right leg showed moderate granulations, while those of the left leg possessed abundant granulation tissue which in places projected well above the cutaneous margins. There were a few superficial varicose veins on each leg. The usual pigmentation, scaling and leathery thickening of the skin noted in these cases was present over the lower two-thirds of each leg. The urine was normal; the Hinton, Wassermann and Kahn reactions on the blood serum were negative. Treatment through the first 5 months consisted of ultraviolet radiation and various ointments, without improvement. On January 11, 1934, topical applications of gentian violet solution were instituted and by March 12, 1934, all ulcerations were healed. Check-up twice through the following year, the latest being March, 1935, revealed no recurrence. The predominant ulceration in this case was considered to be of the hypertrophic type.

CASE 2.—M. C., an Irish-American housewife, aged 60 years, is a vivid example of the extreme chronicity that some of these ulcers may undergo. She entered the Surgery on April 11, 1916, with a sloughing ulceration, 6 by 8 centimeters in size, over the lower left leg. Treatment consisted of the usual methods, including pressure bandages, elastic stockings and ichthyol, zinc oxide, mercurochrome, scarlet red and aluminum subacetate dressings. The ulcer would clear, then recur, and finally on February 1, 1933, after a total of 249 visits, she was referred to the Vein Clinic where twenty-one additional visits were required. Seven injections for varicose veins were administered, and butesin dressings were applied to the ulcer. Overlapping the treatment received in the Vein Clinic, from June 1, 1933, the patient made weekly visits to the Skin Clinic for ultraviolet radiation up to February 21, 1934, when her attendance lapsed. The urine was normal; the Hinton, Wassermann and Kahn tests on her blood serum were negative. She returned 2 years later on May 14, 1936, with an ulceration above the left internal malleolus and a constricting band of scar tissue around the ankle. That portion of the leg above the constricting band became swollen through the day unless an elastic bandage was worn for support. Three visits for gentian violet application were necessary to heal the ulceration. Subsequent follow-up through

August 20, 1936, revealed the ulcer to have remained healed. This ulceration primarily was considered to be of the hypertrophic type, but was later complicated by varicosities and edema, and eventually by local anemia from scar tissue.

CASE 3.—L. E., a German housewife, aged 63 years, was referred from the Surgery on March 9, 1932, because of ulcers on the right leg and a positive Hinton test. Ten years previously she had had several ulcers over the same area which healed but left residual scarring and atrophy of the lower third of the leg. Her syphilis was of the tertiary asymptomatic variety and of 28 years' duration. The present leg ulcerations were of 3 years' duration. No varicosities were noted. Treatment for syphilis* did not influence the lesions one way or the other, but finally at the end of 11 months with combined systemic and local therapy the leg healed. The ulceration continued to recur up to June 3, 1936 when an area 8 by 6 centimeters, containing ten small ulcers 6 to 2 centimeters in extent, was involved. The ulcers were superficial and dry, possessed a greyish base and were surrounded by marked scarring. Moderate edema was present over the upper two-thirds of the leg. Pain kept her awake at night. An elastic bandage over the edematous area and gentian violet solution locally promoted healing within a few weeks, whereas previously supportive dressings alone did not cause healing. These ulcerations were considered to be of the anemic type due to local scarification.

CASE 4.—W. G., an American male, aged 75 years, when first examined August 6, 1935, presented edema of the entire left leg and over the lower third there were multiple, small, shallow ulcerations from which oozed a thin, clear, serous fluid. The granulations were pale, moist, soft and spongy, and the epithelial border was inactive. The urine was normal; the Hinton, Wassermann and Kahn tests on the blood serum were negative. Here the use of gentian violet solution was ineffective, since the tissues would not take the stain, the latter being constantly diluted and washed away by the serous discharge. Later when the edema had subsided and gentian violet was reapplied, the ulcers healed within 4 weeks. These ulcerations were considered to be of the edematous type.

CASE 5.—M. L., an Irish housewife, aged 41 years, entered the Surgery October 7, 1929, with an ulceration of the left leg of 4 years' duration. She made a total of thirty-eight visits within the following 7 months, during which time firm adhesive strapping, zinc oxide, spirits of camphor, aluminum subacetate, mercurochrome, Unna's paste, scarlet red, ergophene, hexylresorcinol, carbona and hydrogen peroxide were applied. On May 26, 1930, the patient was referred to the Skin Clinic. The ulcer presented a hard, calloused and thickened border and a depressed, somewhat smooth, greyish, central portion, with no tendency toward healing. The urine was normal; the Hinton, Wassermann and Kahn reactions were negative. Through approximately the following 4 years, comprising 137 visits, ultraviolet radiation and various local applications resulted in partial healing of the lesion. On February 1, 1934, gentian violet treatment was instituted. Fourteen additional visits were necessary before the lesion eventually healed in September of that year. A check-up on January 23, 1935, showed the area healed, the scar being thin and flexible. This ulceration was considered to be of the cornified type.

*Treatment for syphilis in this instance consisted of bismuth salicylate intramuscularly, arsphenamine intravenously and potassium iodide and mercury by mouth.

COMMENT

With the use of aqueous gentian violet as a topical application the results are so definite that an approximate estimation of the time required to heal the ordinary ulcer may be made. Its method of application is quite simple. When one clearly grasps the underlying principles and accurately applies them, the results are meritorious and gratifying.

SUMMARY AND CONCLUSIONS

1. Fifteen cases of patients with resistant chronic leg ulcers are reported. Each patient, previous to the institution of gentian violet treatment, had received most known forms of therapy for 1 or more years with partial or incomplete success.

2. The use of gentian violet in 2 per cent aqueous solution as a topical application for leg ulcers is described.

3. All ulcers responded successfully to this form of treatment. They healed in a comparatively short period of time, the resulting scars being of a smooth, fine texture, in some instances hardly distinguishable from the surrounding normal skin.

4. The gentian violet solution as used on these cases appeared to be an efficient bactericidal agent and through its crust formation provided a protective covering which prevented further bacterial invasion.

5. All patients were ambulatory during the period of treatment.

REFERENCES

1. Krinsky, C. M.: Treatment of varicose ulcer by gentian violet. New Eng. J. Med. 211:803 (Nov. 1) 1934.
2. Unna, P. G.: The Histopathology of the Diseases of the Skin. Walker's translation. New York: Macmillan & Co., 1896.

SUGGESTIONS FOR THE BACTERIOLOGY LABORATORY OF THE SMALL HOSPITAL

BY SIDNEY C. DALRYMPLE, M.D.*

SMALL hospital laboratories, while functioning adequately in their clinico-pathologic procedures, often fail in meeting their obligations in bacteriology. The primary difficulty lies not in the inability of the technician to understand and meet the various problems, so much as in the lack of proper equipment and organization of the laboratory. The purpose of this communication is not to point out the errors of commission but to call attention to three simple procedures which will materially aid in overcoming the errors of omission. To this end the following suggestions are made:

1. That the laboratory stock an adequate supply of the following dehydrated media:

Nutrient agar.
Nutrient broth.
Loeffler's blood serum.
MacConkey's agar.

2. That blood agar plates, chocolate agar slants, MacConkey's agar plates, Loeffler's blood serum slants and nutrient broth in small and large bottles be made up in suitable quantities.

3. That 1 ounce screw-capped bottles be substituted for test tubes and 8 ounce screw-capped bottles be substituted for blood culture flasks.

Blood agar plates should be poured according to the directions in Mackie and McCartney.[1] They recommend first pouring a thin layer of plain agar into the Petri dish and allowing it to set; then pouring the blood agar upon the plain agar. This produces sufficient thickness of the medium to prevent drying and cracking, both in storage and during incubation. We have found that media so prepared remained unchanged in the refrigerator for a period of one month. We suggest that in the pouring of plates a dust-free box be employed to prevent contamination. The box that we have constructed and that has proved satisfactory is 36 inches square by 18 inches in height. The frame is of wood and the sides, top, floor and turntable are of masonite. The removable front is fitted with rubber dam in which are two armholes with sleeves attached. On one side is an air filter, a small square opening fitted with a double wire screen between which is a thick layer of cotton. The removable front is opened and the plates arranged on the turntable. The medium to be poured is placed on a movable shelf running across the inside of the box and the front is again sealed. The dust-laden air is removed by means of the hospital vacuum system for 15 minutes, but an ordinary vacuum cleaner can be substituted. The arms of the operator are then passed into the sleeves and the plates poured. A window in the top of the box permits a good view of the interior. The turntable with a diameter of approximately 3 feet will accommodate between thirty and forty plates. This number of blood plates should last the average small hospital laboratory a period of 2 to 4 weeks. Only one culture should be made on each plate.

MacConkey's agar for use with the Bacterium group is recommended because of its excellent keeping qualities. Plates can be made up at monthly intervals.

The substitution of screw-capped bottles for test tubes has simplified bacteriology for the small hospital laboratory. A full discussion of the use of such bottles can be found in the paper by McCartney.[2] We wish to point out that media so prepared will remain moist and uncracked for a period of months (fig. 1). The problem of pH change in the liquid media through liberation of alkali from the glass can best be met by occasional testing and discarding of unsuitable media. We use a standard 1 ounce hard glass bottle, fitted with a bakelite screw cap, which stands repeated autoclaving.

FIG. 1. Loeffler's blood serum slant, bottled for 4 months and showing no change in the amount of water of condensation.

*Dalrymple, Sidney C.—Pathologist, Newton Hospital. For record and address of author see "This Week's Issue," page 32.

REFERENCES

1. Mackie, T. J., and McCartney, J. E.: Blood Agar Plates: An Introduction to Practical Bacteriology. Fourth Edition. Edinburgh: E. & S. Livingstone, 1934, p. 107.
2. McCartney, J. E.: Screw-capped bottles in the preparation and storage of culture media. Lancet 2:433 (Aug. 19) 1933.

RELIGION IN MEDICINE*

BY J. M. T. FINNEY, M.D.†

WHEN my good friend, Canon Trowbridge, did me the honor, a short time ago, of asking me to come to St. Paul's and speak at the evening service, more especially to interested members of the medical profession, on this the evening of St. Luke's Day, I confess I was in a quandary. Was I sufficiently well-grounded in my own faith and experience to be able to bring a worth-while message to others? This and many similar questions coursed through my mind. Very conscious of my own shortcomings, it took some time to decide that perhaps I should have the courage of my convictions and accept the Canon's very kind invitation, and discuss with you, my fellow practitioners, for a few minutes this evening, some of the advantages, as I see them, that may come to us busy doctors from taking religion, and what it means, into our everyday professional lives. This decision was rendered all the more difficult because, as a doctor myself, I well know the attitude of cynicism and doubt, even active hostility, that exists toward religion and its organized agency, the Church, in the minds of many of our beloved profession.

If only some word of mine may be the means of causing some doctor or layman, within the sound of my voice, to stop and think on these things, to ponder well whether or not by taking religion into his professional life it may not become richer and fuller and more satisfying than anything that he had heretofore experienced, our meeting together this evening will not have been in vain. In what I shall have to say I shall not attempt to discuss theological dogmas or creeds, or the immortality of the soul, or the future life. I fear that I could not do so intelligently, even if disposed to try. Rather would I have just a plain heart-to-heart talk with you, my fellow practitioners, and our lay friends present, as an older brother (for I suspect that I have advanced farther along life's journey than most of you) to his younger brothers and sisters, about the things of the spirit and about developing, and that right early, a philosophy of life, a plan that you can follow, a chart and compass by which you can steer when the clouds lower and the storms begin to gather. For experience shows that, unless one has something outside of and higher than self to which he can look for guidance and by which he can shape his course in life, he will, like a rudderless ship at sea, drift helplessly with life's currents, tossed about by the winds of doubt and uncertainty, finally be cast, a derelict, upon life's shore. Science, instead of refuting this idea, is tending all the while, as our knowledge increases, to confirm it. Hear what Millikan, one of the foremost living physicists, has to say on this subject: "Every man who is sufficiently in his senses . . . to comprehend the problem of existence must also recognize the existence of something, a Power, a Being, in whom, and because of whom, he himself lives. It is God that gives meaning to the mystery of life." And Bergson, the philosopher, adds, "The foundation of all philosophical thought, and the axiom of axioms, is the fact of a world embracing spiritual life." Such emphatic testimony from such high sources, and many others could be quoted if time permitted, as to the existence of God and the supreme place that He occupies in the physical and spiritual world, confirming as it does accumulated individual experience, should leave little doubt in the minds of thinking men, first, as to the existence of a Supreme Being and, secondly, as to the essential part that He plays in all human affairs.

I want to enter a plea for more of the spirit of true religion in our work as medical men; a deeper manifestation of the human touch that makes the whole world kin; a more strict conformity to the teachings and practices of the Great Physician; in short, the patterning our lives after His. I want to stress the happy effect of religion in "renewing the right spirit within us", in repairing the ill-effect upon our minds and hearts that comes from the too constant grind of our professional lives.

It is singularly appropriate that St. Luke's Day, commemorative as it is of the life and work of the Beloved Physician, should have been selected as the occasion for this gathering. For what group of men and women in their everyday professional lives has a better opportunity to use or a greater need for just what real religion furnishes, than we doctors? Every true physician knows that in the course of ministering to the bodily needs of his patients many instances present themselves, from time to time, where the needs of the soul are even more pressing than those of the body, or where at least the one cannot be satisfactorily treated without due attention being paid to the other. It is in just such cases as these that a kindly word spoken in season by the understanding doctor will frequently bring more relief to a distressed mind or body than pill or potion, the knife or elaborate scientific psychoanalysis. A really humane doctor, one that is thoroughly interested in and

*Delivered at a Special Service for Physicians and Medical Students, in the Cathedral Church of St. Paul, Boston, October 18, 1936.

†Finney, J. M. T.—Professor of Surgery (Emeritus), Johns Hopkins University School of Medicine. For record and address of author see "This Week's Issue," page 32.

understands the weakness as well as the strength in human nature, is in a position to do his patient more good than even the minister, for to the doctor alone ofttimes are revealed the innermost secrets of the soul and, if he is the right sort, a true disciple of the Great Physician, he may do for the patient what nobody else can do. The doctor that is interested only in the physical well-being of his patient often fails to take advantage of the opportunity to do him the maximum amount of good. True religion and medicine should go hand in hand, as complementary forces. What is here meant by "true religion" is that broad, comprehensive expression of religion that embraces the Fatherhood of God and the Brotherhood of Man, that manifests itself as a life rooted in faith in an all-wise, all-powerful, overruling Providence; a faith animated and inspired by love of God and Man, and bearing fruit in all good works, or as someone has well expressed it, "the life of God in the soul of Man". This is the type of religion that I believe in and that I offer you. This is the philosophy of life, with God as its central motif, for which I plead and which, after a long life of sincere personal endeavor to practice, I can heartily recommend. Will you not try it for yourselves? I well know the answers that some of you will give. "Not interested." "I am an agnostic." "I am an atheist." "I do not believe in God or religion of any kind." "The Church is full of hypocrites, who pose as good people, but who are no better than I who make no pretentions to being good, so I beg to be excused." In all fairness one must admit that there is some basis of truth in these allegations, but be it remembered that "One swallow does not make a summer," neither does one church member set the standard for the entire group.

The Church, composed as it is of ordinary human beings, such as you and I, is the generally accepted representative of organized religion. As such, let us for a moment consider our relation and our personal responsibility to it, both as individuals and as members of our honored profession. It is the proud boast of the medical profession that its members are actuated solely, in their professional lives, by the spirit and teachings of the Great Physician, who went about doing good and whose code of ethics embraced the principles embodied in the Golden Rule and the Sermon on the Mount. This being the case, I ask you, Is it not eminently fitting that doctors, of all people, intimately associated as they constantly are with the sick and the dying, the discouraged and the downhearted, should show an interest in religion by actively identifying themselves with the Church? Says Ritchie Smith, "The question, 'What is religion?' is as old as man. It has been well said that man is inescapably religious. God hath set the idea of eternity in his heart, and try as he will he cannot cast it out. Real atheists are few. Most of those who profess their unbelief are fitly represented by the man who exclaimed, 'I am an atheist, thank God!' Francis Bacon, one of the profoundest thinkers of all time, once said, 'A little philosophy inclineth man's mind to atheism, but depth in philosophy bringeth men's minds about religion.' Now and then some learned professor rises with a great air of authority to inform us that faith in God is dead or dying and belief in immortality is virtually extinct. 'Religion,' says he, 'is a superstition that should long since have been outgrown, and has no proper place in an era of reason and science.' One often wonders, as one reads such oracular statements, where the men live who make them. Do they associate with ordinary people? Do they know anything of the world in which they live, not the world of their own fancy, but the world of fact, of flesh and blood, the world in which the mass of mankind live and move and work and think? For the fact is most obvious, that while men differ widely in their thought of God and the life hereafter, they are nevertheless thinking earnestly, and seeking eagerly the answer to the momentous question, 'What is religion?' " One frequently hears repeated the statement that, "never have men been more willing to discuss religious questions than now."

Doctor Link in his recent book, entitled "The Return to Religion," has this to say: "Religion . . . includes the belief in a divine moral order, which is expressed in the Ten Commandments and in the life of Christ (the Great Physician), and the acceptance of the Church as the chief, even though imperfect, vehicle of religious truths that are greater than science, and values that are higher than reason. Religion, therefore, is not the refuge of the weak, but the weapon of those who would be strong. I see religion as an aggressive mode of life, by which the individual becomes the Master of his environment, not its complacent victim." Said Phillips Brooks, "No man has come to true greatness, who has not felt in some degree, that his life belongs to his race, and that what God gives him He gives him for mankind."

I have already referred to the prevailing impression that doctors as a class are irreligious. But this indifference upon the part of the medical profession or scientists in general to religion is not universal—far from it. The names of many, both living and dead, that stand high on the roster of pure science and scientific medicine, are to be found enrolled as earnest, active members of the Church and firm believers in God and a hereafter. Let me mention just a few of those dead, names to conjure with, all of them—Sir Isaac Newton, Lord Kelvin, Agassiz, Faraday, Sydenham, Rush, Pasteur, Weir Mit-

chell, W. W. Keen and Sir William Osler, whom I have myself heard more than once say that he "would rather be wrong with Plato, than right with those who deny the immortality of the soul." Just one other name will I give you, that of your own beloved Doctor Oliver Wendell Holmes, the genial Autocrat of the Breakfast Table. Listen while he speaks:

> Lord of all being throned afar,
> Thy glory flames from Sun and Star.
> Center and soul of every sphere,
> Yet to each loving heart how near.
>
> Sun of our life, thy quickening ray
> Sheds on our path the glow of day,
> Star of our hope, thy softened light
> Cheers the long watches of the night.
>
> Grant us Thy truth to make us free,
> And kindling hearts that burn for Thee,
> Till all Thy living altars claim
> One holy light, one heavenly flame.

Surely there can be no doubt as to his faith!

Thinking men in all walks of life are becoming gravely concerned as to the ultimate effect upon society of the various forces, destructive and constructive, political and economic, now actively at work. Books and magazine articles dealing with the effect of, and vital necessity for, the beneficent influence of revealed religion in all our relations with one another, individually and collectively, nationally and internationally, are multiplying. The burden of their cry to society is, "Back to religion," since experience, say they, has shown that individuals cannot disregard the facts of religion without grave consequences to themselves, their characters and their personalities. The same is equally true of nations. The world is awaiting with bated breath the outcome of the experiments now being carried on among certain of the European nations. Exhorted by the teachings of Hippocrates, the Great Father of Medicine, to fit ourselves in every way to render the highest possible service to our fellow men, why should not we medical men add to our technical armamentarium the further endowment that comes from the beneficent effect of religion in our own lives, in order that we may be able to impart its healing virtues to sin-sick souls, who may come under our professional care.

When one talks with some doctors and tries to discover the reason for their apparent indifferent attitude toward religion, it is not infrequently difficult to obtain a satisfactory answer. So often it harks back to their college or medical student days, to some particular course in philosophy or biology or in one of the sciences, where their faith was undermined by the teachings of a certain professor or professors. Or it may be that the fact that certain of the more distinguished and popular members of the faculty were reputed to be, or were in fact, avowed agnostics, which at once made this attitude of mind the fashion among the student body in that particular institution. Such an attitude of mind, thus thoughtlessly acquired, may easily develop into a fixed conviction. What a dreadful responsibility for an instructor to assume, the deliberate undermining of the faith of youth! But may it not be possible that this indifference or opposition to religion upon the part of doctors and others may have an even more fundamental basis, namely, the woeful lack of proper early religious training of the youth in our homes? To this glaring defect in our educational and social systems may readily be traced many of the ills so prevalent in church and state today. The medical profession, wielding the tremendous influence that it does in human affairs generally, can ill afford to sit on the sidelines and look idly on while the battle rages between the powers of good, represented by religion and the Church, and those of organized evil.

Among thoughtful minds there appears to be a marked difference of opinion as to whether the influence of the Church and what it stands for in the community and in the lives of men are on the increase or decrease. The majority of people will probably incline to the latter view, and, as proof of its correctness, they will point, among other things, to the number of vacant churches that one now sees and to the number of vacant pews in those churches that are generally considered to be in a fairly flourishing condition. But especial emphasis will likely be placed upon the fact that the younger generation does not appear to be church-minded, as shown by the comparatively small proportion of young people to be found in regular attendance upon public worship or taking an active part therein. But be that as it may, there are those, on the other hand, who, while readily admitting that not so much attention as formerly, perhaps, is now being paid to church membership and to the observance of the outward forms and ceremonies of the Church, nevertheless insist that there is manifest a widespread undercurrent of religious feeling, which, while not expressing itself so much along emotional lines as formerly and hence not so much in evidence, is nonetheless deep and genuine. Informed, open-minded observers will, I feel sure, find an element of truth in both of these positions.

In any intelligent discussion of this question, there are certain basic facts, the effect of which must first be considered. First, changing conditions all along the line are responsible for much that is happening today that is so different from that which obtained a generation or two ago. For better or for worse, individuals no longer act or think as their fathers and mothers did. Secondly, lack of respect for constituted authority of any kind, parental, church or state, is much in evidence. And, thirdly, self-

expression, so-called, seems to be the order of the day. It is one of the tenets of modern education. Properly regulated it is, no doubt, to be commended, but when too liberally interpreted it means license to do as one pleases, regardless of other considerations and of other people's rights. As commonly used, it is often but a bit of camouflage, a polite expression used instead of the harsher term, "selfishness". One meets it in all walks of life — in personal relations with each other and between nations; in politics; in business; in the professions; even in our own beloved profession. What are political corruption and graft that so disgrace the administration of our federal, state and municipal governments; what are exaggerated nationalism, shameless disregard of treaty obligations and interracial tyranny and oppression, such as are exhibited today in certain Continental countries? What was the cause of the recent widespread loss of confidence in our financial institutions, with its resultant business depression? What is the real cause of social and industrial unrest, with the present unprecedented lack of employment and its associated evils? And what causes war, with which the world is again threatened, that futile, insane, outworn, barbarous method of settling international disputes—as if it ever really settled anything but the ruthless maiming and slaughter of untold numbers of the best manhood of the countries involved and the destruction of much valuable property? And be it remembered that future wars, thanks to the airplane and the use of diabolical poisonous gases and bombs, will be waged against women and children, as well as men. Back of all the other causes are selfishness, greed of gain, lust for power, disregard of the rights of others. No age and no nation have been free from this blot on our civilization. Selfishness in all its forms is a universal and a very human trait, one that can only be successfully combated by the redeeming power of religion and its organized agency, the Church. If we are correct in our analysis of the situation and the conclusion that religion, for which the Church stands, is the only effective remedy for the ills, both national and international, that affect society, then it necessarily follows that a very great responsibility rests upon the three important component parts of the Church, namely, the pulpit, the pew and the home.

First, then, let us in no hypercritical spirit, far from it, take a look at the pulpit, from the point of view of the pew. What is its main objective, and what are some of the causes of the lack of effectiveness charged against it? It will be admitted at once, I think, that, generally speaking, the main function of the pulpit is to proclaim the love of God, the Gospel of Salvation through Jesus Christ and the Redemption of a sin-sick world, as revealed in the Bible. To their everlasting credit be it said that by the great majority of ministers this sacred function is being faithfully performed. However, the abstruse and often high-flown, ethical, philosophical and metaphysical discussions that one occasionally hears from the pulpit, interesting and important as they perhaps may be, do not advance one very far in his religious life, nor are they very satisfying to a hungry soul.

The more human a man is the more understanding he is of another's needs, and the more willing he is to help, be he minister or doctor, the more he can accomplish in his dealings with other people. If one really wants to be successful in dealing with people in all walks of life, in church or state, in the home, in the hospital, in private practice, in business, on the street, one must travel by the human route. After all is said and done, the real human needs are closely bound up in the great eternal verities of life, such as love, truth, honor, honesty, loyalty, friendship, worship, God. What wonderful texts for sermons, lay or clerical, are to be found here!

But let us laymen not forget that the shortcomings in the pew are many and far more grievous than those met with in the pulpit. We must first remove the beam from our own eyes, before looking for the mote in our brother's eye. One great trouble is that congregations and the public in general ask too much of their ministers. They expect them to be supermen, to bear the whole burden of the Church alone or with a minimum of assistance from the pews, so prone are the occupants of the latter to shirk their full responsibilities. I speak with shame, as one of them. There needs to be more active, whole-hearted cooperation, deeper consecration, more willingness to spend and be spent in the Master's service, better teamwork between the pulpit, the pew and the home. Until this has been successfully accomplished, no great advance need be expected.

But how about the home? The most significant changes, perhaps, will be found here. The home is the citadel of society, and anything that concerns it vitally affects the welfare of the human race. But what do we find? The family altar has been largely broken down; systematic reading of the Bible and regular attendance upon church worship are fast becoming little more than a tradition. Parents, as a whole, spend less time with their children. They are too prone to turn them over to nurses or governesses or to let them run wild. In many homes discipline is entirely lacking, and the children are left largely to their own devices or to the tender mercies of the servants. The importance of the early training of youth cannot be exaggerated. "Train up a child in the way he should go, and when he is old, he will not depart from it" is as true today as when first spoken. Yes, lack of proper home train-

ing, unfavorable home surroundings and domestic misunderstandings and infelicities between fathers and mothers resulting in separation and divorce are among the causes largely responsible for waning interest in religion, church and other worth-while activities, as they are for the appalling increase of crime in recent years, especially among the youth of both sexes.

If what we have been saying is true, and, I think, it will be pretty generally admitted, then let us all—pulpit, pew and home alike—unite in honest confession "that we have done those things that we ought not to have done, and have left undone those things that we ought to have done." And then, with a prayer for God's help, let us determine that we will do better in the future than we have done in the past; that we will devote our time and energies more and more to His service and follow more closely in the footsteps of the Great Physician. It is for us weak, imperfect mortals, in spite of discouragements and difficulties, to go on hoping and praying and, most important of all, practicing our religion, convinced that the witness that we bear in our everyday living is the best service that we can render and confident that in His strength eventually we can, with others of His faithful followers, pray from our hearts those beautiful lines of Edwin Parker:

Master, no offering costly and sweet,
May we like Magdalene, lay at Thy feet.
Yet may love's incense rise,
Sweeter than sacrifice, Dear Lord to Thee.

Daily our lives would show
Weakness made strong;
Toilsome and gloomy ways
Brightened with song;
Some deeds of kindness done;
Some souls by patience won;
Dear Lord to Thee.

Some word of hope, for hearts
Burdened with fears;
Some balm of peace for eyes
Blinded with tears;
Some dew of mercy shed;
Some wayward footsteps led,
Dear Lord to Thee.

Thus in Thy service Lord,
Till eventide
Closes the day of Life,
May we abide!
And when Earth's labors cease,
Bid us depart in peace,
Dear Lord to Thee.

Fellow medical men, young and old, physicians, surgeons and medical students, co-members of a guild that prides itself, and rightly so, upon its high ideals of service to sick and suffering humanity, a profession sworn to give of its best, even life itself, in caring for the physical and mental ailments of its fellow men, I challenge you to an even higher service. Take on the *full* armor of God and be not content to wage merely conventional warfare against man's traditional enemies, diseases of the body and the mind, but, following the example of St. Luke, whose day we celebrate, and that of Jesus Christ, the Great Physician, our elder brother, so prepare yourselves to be ready like them, whenever opportunity offers, to afford your patients spiritual, as well as physical, aid and comfort. But may I remind you that in order to be able to do this, in addition to keeping up with your strictly professional studies, you must, like St. Luke, study the life and teachings of the Great Physician, learn of Him and pattern your lives after His. Thus, and thus only, will you be able to experience the fullness of joy that comes with perfect service to God and Man.

DR. JACOB BIGELOW*

BY CHARLES F. PAINTER, M.D.†

I AM not attempting any complete biographic account of Dr. Jacob Bigelow. That was done by Dr. Ellis, a contemporary, shortly after Dr. Bigelow's death in 1879 and more recently by Dr. Chester Stellhorn in *The New England Journal of Medicine* (**213**: 405 [Aug. 29] 1935). I am assuming that many of you, like myself, holding in respect representatives of several distinguished families that have made Boston medicine famous in the years gone by, have thought of Dr. Bigelow as chiefly distinguished by reason of a paper he prepared at the Annual Oration before the Massachusetts Medical Society in 1835 entitled "Self-Limited Diseases."

Outstanding as has been this communication, even to this day, it was only one of many reasons which posterity has for honoring his memory, as was brought strikingly to my attention when a considerable number of old papers belonging to Dr. Bigelow were recently found in the loft of an old warehouse and presented to the Boston Medical Library. In looking them over, it occurred to me that this club could render its younger members no better service than from time to time presenting, in brief review, the activities of the pioneer observers in the field of medicine, nor need this be done in any spirit of disparagement of modern methods of research and practice.

*Read before the Boston Medical History Club, April 21, 1936.

†Painter, Charles F.—For record and address of author see "This Week's Issue," page 32.

I have no reason to think that Jacob Bigelow ever had any motto by which he patterned his life but, if he had, it might very well have been the last line of his Phi Beta Kappa poem, read at the Harvard Commencement of 1811, "Firm to excel and patient to be great."

His life certainly exemplified the first and might well have been regarded as a fulfillment of the last clause of that sentence.

Scientific medicine, as we know it, had made no place in Dr. Bigelow's day. Unless anatomy is regarded in the light of a biologic science, there was little that provided scientific training in the medical curriculum of that period. Dr. Bigelow had provided such a training for himself through his interest in botanic studies. These to be sure had furnished a species of scientific discipline for Colonial physicians and their medical forbears on the continent of Europe and in Great Britain. With them, however, it was largely to provide the "simples" they needed in their therapy. To Dr. Bigelow it was more than that, as may be seen in these evidences of his careful work in studying the flora, first of Boston and vicinity and later of all New England. The mass of correspondence we have among these papers from botanists in various parts of the world attests to the thoroughness of his work.

I am sure that he, in doing this, was fitting his own mind to take some of the advanced positions which he did in regard to the practice of medicine and, also, in regard to the general problems of education. His was the day of polypharmacy and the reaction against it was taking irrational forms, notably in the Hahnemannian cult. In his opposition to this system his training led him to a much more scientific viewpoint and, though he had no sympathy with the methods of homeopathy, he did appreciate the fundamental cause for its growing popularity.

If you have not read his paper entitled the "Paradise of Doctors," it would be worth your while to do so, for he neglected no means in his power to force upon public attention what he believed to be true, and that was that the function of the physician was largely to assist nature and, far more rarely than was the rule at the time, to interfere on her behalf. That he should have brought himself to that position showed his independence in thinking, for Benjamin Rush was perhaps America's foremost medical teacher in that day and Dr. Bigelow had been taught by him. One of the tenets of Rush's faith was that the healing of disease was to be brought about through the art of medicine and that "nature should be thrown out of the window". His "Self-Limited Diseases" was Dr. Bigelow's refutation of his teacher's doctrine.

A still further help to his interest in scientific methods was his acceptance of the responsibility for the course of lectures at Harvard University upon the Count Rumford Foundation. This was a lectureship, the purpose of which was to show the applicability of "science to the useful arts." In preparing himself to give this course he made it his business to go about among the artisans of Boston and learn as much as he could from them, practically. In doing so he acquired considerable proficiency in many purely technical matters and doubtless helped to possess himself of the spirit of scientific accuracy which is now instilled into medical students through prescribed courses of study in the curricula.

We have in this collection a number of the notebooks he used in these courses as a basis for his lectures. Here are, also, his lectures in pharmacology and materia medica, given to his classes in the Harvard Medical School, written in his own hand—on one side in Latin and on the other in English.

In passing, it may be recalled that he was on the committee that prepared the first edition of the United States Pharmacopeia and subsequently compiled a smaller volume that was probably more representative of what he himself thought adequate to meet the pharmaceutical requirements of a rational therapy.

He was selected in 1833 to head a commission to study the prevailing smallpox epidemic that was ravaging the entire Atlantic seaboard. As a result, so it was claimed, of the adequacy of the quarantine measures established by that commission, Boston had the lowest death rate of any city on the Eastern coast of the United States during the famous epidemic of 1833 and 1834.

Another public health matter that engaged Dr. Bigelow's attention was the menace to health attendant upon the methods of burying the dead prevalent at the time. With the increase in urban population this was certain to increase. He was the prime mover in the incorporation of the first cemetery association and it required considerable persuasion before this was accomplished, but the result was the Mount Auburn Cemetery. He designed the gateway of entrance, laid out the drives, supervised the planting of shrubs and hedges and presented the Association with a statue of a sphinx at an expense to himself of from six thousand to seven thousand dollars. For many years he was active in the conduct of the Association's affairs.

A good deal of the material that came to the library in this Bigelow collection pertains to his activities in connection with the cemetery's management.

Another of his interests growing, I should presume, out of his Rumford Foundation lectures was the organization of the Massachusetts Institute of Technology, of which he was a pro-

moter, and it was here, at the dedication of one of its lecture halls, that he expressed some views upon education that were quite in advance of his time. He advocated deleting the dead languages from the curricula of institutions of higher education, believing that modern languages possessed all the disciplinary, educational value of Latin and Greek and were of far greater practical importance. It has taken a long time to bring about such a change, yet Dr. Bigelow made the suggestion in 1855. To have brought himself to the point of advocating such a radical move indicates the untrammeled nature of his mental faculties. It must have been more difficult for him than for some to have taken such a stand, because his own classical education was exceptionally good. He used Latin quotations quite freely in his writings and even in sending a note home to his wife telling her where he could be reached if necessary he signed himself with a classical term. He, with a small group of friends, amused themselves by translating the Mother Goose Rhymes into Latin, Greek, French, German and Italian. These are among the papers, which the Library has in its possession.

He was treasurer of the Harvard Medical School Faculty and we have in the Boston Medical Library the record book in which are the accounts which he kept with the treasurer's office of the University in Cambridge. Harvard had a summer medical course conducted under the name of the Tremont Medical School and of this Dr. Bigelow was also treasurer; one may see here a list of students' names and their addresses, the latter of interest as showing the localities where people lived in those days in Boston, where now all is a business section. This Tremont School was started in 1839 and continued until 1855, and during nine sessions Dr. Bigelow was its treasurer and a teaching member of its faculty.

He was for a long time a member of the American Academy of Sciences and for several years its president. One of its officers wrote a very appreciative obituary reference of him and his activities in the society.

There is much more source material among these papers, I am sure, to which I have not time to refer here but I think I have cited enough of it to make most of us wonder how good use we are making of our own time. We must remember that all of this was done without any of the aids that we may summon to our assistance and leaves out of consideration all of his private professional activities and the time he devoted to his service at the Massachusetts General Hospital.

I submit, he was "firm to excel and patient to be great".

DO YOU KNOW?

Even small babies can be taught to take orange or tomato juice from a spoon, and it is good for them to learn to do this.

Among the leading causes of death in New York State pneumonia ranks third—tuberculosis seventh. Heart disease caused 42,399 deaths; cancer 17,703; pneumonia 11,078 and tuberculosis 7,598.

Most deaths from pneumonia occur during the winter months.

Pneumonia was recognized by Hippocrates (460-370 B.C.) but was confused with pleurisy, which was regarded as a less severe form.

Lord Chesterfield said: You must look into people as well as at them.

Frostbite is not helped by rubbing with snow the parts affected, as is popularly recommended by "grandma". Warm the parts gradually. It is dangerous to warm rapidly by sitting near a fire or stove. Rubbing, if gently done without severe friction, will help.

"Backache"—who does not remember the patent-medicine advertisements that years ago appeared everywhere showing a man bent over, with his hands on his back, while the headline screamed: "Stop that pain!" After a while people learned that nothing could be put into a bottle to stop the pain because what might be the cause of backache in one case might not be in another. Diagnosis comes first, treatment afterward.

A learned judge was once asked why his opinions were so seldom reversed on appeal. "I make myself master," he replied, "of the facts in the case, and then I get the law from my wife." What he meant was that once the facts are clear, the rule of law was not difficult to find. When a man is sick, the first thing is to get the facts, all the facts. The next thing is the diagnosis, sometimes difficult. Last comes treatment — usually the simplest part of the entire process of healing.

H. L. Mencken said: It is the dull man who is always sure, and the sure man who is always dull.—*Excerpts from the Bulletin of the New York State Medical Society.*

CASE RECORDS
of the
MASSACHUSETTS GENERAL HOSPITAL

ANTEMORTEM AND POSTMORTEM RECORDS AS USED IN WEEKLY CLINICOPATHOLOGIC EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 23011

PRESENTATION OF CASE

A thirty-six year old native housewife was admitted complaining of increase of weight, shortening of stature and girdle pains.

The patient had been perfectly well until two years before entry, when she had a sudden attack of colicky pain in the right upper quadrant associated with vomiting. Subsequently she was placed upon a fat-free diet and never had recurrence of a similar discomfort. At about the same time she first became constipated and required frequent cathartics. Her stools, however, were unchanged. She began to have occasional sudden swellings of her face and body which lasted for several hours. These were presumed to be angioneurotic edema. Eight months after the onset her gallbladder and appendix were removed. These were said to have been normal. The transient swelling continued and she began to feel quite heavy while climbing stairs. Three months after the operation she first noted an increase of hair on her face, body and arms which was said to be lessened somewhat after the administration of thyroid and pituitary extract. A month later she had a severe furunculosis. A year before admission she had an attack of colicky pain in the left upper quadrant and flank which lasted for three days. At the end of this time she passed a bean-sized kidney stone. Several times during the ensuing few months, without any premonitory symptoms she fell to the floor while walking. She never lost consciousness and promptly picked herself up unhurt. Subsequently she noted progressive shortening of stature and increased size of her face, hands, wrists and ankles. Eight months before coming to this hospital she had her initial attack of girdling chest pain. The attacks were brought on by changes in position, lasted for several minutes, and were sufficiently severe to cause her to gasp for breath. There were occasional associated numbness of the thighs and tingling in the legs. At this time edema of the ankles appeared, first on the right side. It was relieved by elevation of the legs. She also began to have headaches, transient blurring of vision, spots before her eyes, and her voice became husky in character. For several weeks there were slight dyspnea and palpitation on exertion. A week before admission she had a slight cough with expectoration of frothy, bloody sputum. For about one year she had noticed gradual accumulation of telangiectases on her face and frequently developed black and blue spots on her body without any trauma. Her catamenia had begun at eighteen years and had occurred every twenty days, each period lasting for ten days. Subsequent to her gallbladder operation she had amenorrhea for seven months. Then for four successive months she had scanty flow and thereafter no further menses although periodic molimina occurred.

Physical examination showed a well-developed and nourished woman with a florid, rounded, puffy face. The cheeks were covered with numerous telangiectases. The skin was rough, coarse, moist and contained many bluish scars of healed furuncles. There were several telangiectatic spots on the legs and feet, and the skin over the shins was diffusely reddened, wrinkled, and atrophied in appearance. There was moderate trichosis over the temples, upper lip, and back. The pubic hair had suggestive male distribution. A lipoma was noted in the left lower anterior portion of the neck. The heart was slightly enlarged to the left and the sounds were distant in character. No murmurs were audible. The blood pressure was 150/110. There were dulness and diminished fremitus, breath and voice sounds at the right base and a few inconstant rales at both bases. There was slight kyphotic angulation of the eighth dorsal vertebra, where considerable tenderness was elicited. There was also some tenderness over the lumbar spines although no deformity was discerned. The abdominal wall was thrown into folds below the costal margin and the xiphopubic distance evidently shortened. There was slight tenderness in the right flank, but no other abnormalities were noted. Vaginal examination showed slight leukorrhea but was otherwise negative. The clitoris was normal in size. The wrists and ankles were broadened in proportion to the size of the arms, and the hands likewise seemed coarsened, although the fingers were normal in shape. Tender areas were found over the humeri, femora and tibiae. No edema was noted. Neurologic examination was essentially negative. The visual fields showed a questionable right homonymous hemianopia. Both fundi showed slight arteriovenous nicking and there were a few small hemorrhages and whitish plaques of exudate. The discs were normal.

The temperature, pulse and respirations were normal.

Examination of the urine was negative. The

specific gravity was 1.020. The blood showed a red cell count of 5,100,000, 80 per cent hemoglobin. The white cell count was 11,650, 82 per cent polymorphonuclears. Stool examinations were negative. The serum calcium was 10.41 milligrams and the phosphorus 3.04 milligrams. The phosphatase was 9.02 units, and the serum protein was 6.8 grams. The chlorides were equivalent to 102 cubic centimeters N/10 sodium chloride and the cholesterol was 316 milligrams. The CO_2 combining power was 56 volumes per cent, and a basal metabolic rate was minus 30. Gastric analysis showed 45 units of free acid after histamine and 55 units total acid. An electrocardiogram showed slight left axis deviation with slurring of the Q-R-S complexes, inverted T_1, a low T_2 and diphasic T_3. A sugar tolerance curve exhibited a fasting blood sugar of 96 milligrams and subsequent readings were 163 milligrams one half hour after a test meal, 264 milligrams at one and a half hours, 266 at two and a half hours and 134 milligrams at four hours. No glycosuria was apparent. A phenolsulphonephthalein test demonstrated 65 per cent excretion of dye in two hours.

X-ray examination of the dorsolumbar spine, pelvis and ribs showed a marked degree of decalcification with wedging of the eighth, ninth, eleventh and twelfth dorsal vertebrae and probably the second lumbar. A lateral view showed typical fishbone vertebrae throughout the lumbar and dorsal regions. There was a large irregular area of calcification overlaying the fifth lumbar vertebra and upper sacrum and another overlaying the right side of the twelfth dorsal vertebra just medial to the upper pole of the kidney. Other films showed the areas of calcification to be within the region of the mesentery and were interpreted as calcified mesenteric glands. No soft tissue masses were demonstrated. The skull showed slight decalcification but the sella turcica was normal in size and shape. The long bones showed decalcification to a less well marked degree than the spine. A chest plate showed a high diaphragm on both sides with increase in width and density of the hilar shadows. There was generalized mottling along the course of the lung markings throughout both mid and lower lung fields. The heart shadow was prominent in the region of the left ventricle, and the aorta was tortuous. An intravenous pyelogram revealed unusually small kidneys. The dye appeared on both sides and outlined normal kidney pelves and calices. A jaw x-ray showed marked generalized radiolucence of the mandible and maxilla. In the lower right premolar region the lamina dura was extremely thin and in some places absent. In the right upper molar region there was localized osteoporosis, and the lamina dura was absent about the second molar. The third molar here had a large cavity.

The patient was treated supportively and presented no marked clinical change. Two months after entry another sugar tolerance test showed a fasting blood glucose of 155 with subsequent readings of 216 a half hour after the meal, 310 milligrams at one and a half hours, 339 milligrams at three hours and 323 milligrams at four hours. Urine at the four hour period showed a red precipitate with the Benedict test. At about this time she began to develop furuncles on the back. Subsequent urine examinations showed persisting glycosuria and the patient was given varying doses of insulin with restriction of carbohydrate intake. A month later two teeth were extracted under local anesthesia. A bone biopsy from the tibia was reported as normal. Repeated estimations of calcium showed values varying between 8.8 and 10.95. The phosphorus levels extended from 2.02 to 3.06 milligrams. The diabetes became progressively worse, and five months before entry she required 90 units of insulin daily while on a low carbohydrate diet. A course of x-ray treatment to the skull was without effect, and the amenorrhea continued. Frequent furunculosis made her quite uncomfortable, and another examination at this time showed that her face had become more plethoric. Her heart showed a rapid gallop rhythm and the liver edge, which was barely palpable, was slightly tender. There were marked wasting and weakness of the muscles of the extremities. A few small purplish striae became visible on the abdomen. During the succeeding month on the same diet the insulin requirement gradually diminished to 20 units daily, and for short periods she required none at all. Six months after admission, having had occasional girdle pains across the chest, she was suddenly seized with a clutching, choking sensation under the sternum, going up to the throat and causing her to feel breathless. She became ashen in appearance, orthopneic and sweat considerably. Many "brittle" rales were heard throughout both chests. The pulse was 130. The blood pressure was 135/90. The attack persisted for about one hour and was not relieved by two doses of morphin. An electrocardiogram showed Q_4 nearly absent and an upright T_4 and other signs considered significant of coronary occlusion. Several days later the blood pressure had risen to 160/100, and the rales had disappeared. A rapid gallop rhythm, however, persisted and she developed a sore mouth and many large skin infections, which required surgical treatment. About three weeks after the acute attack of chest pain a gluteal phlegmon was drained. Subsequently the patient's blood pressure dropped to 80/50, and she became extremely weak. She became pro-

gressively worse and died three weeks postoperatively, seven months after entry.

Differential Diagnosis

Dr. Soma Weiss*: This is the unusual story of a 36 year old housewife in whom, in a period of two and a half years, a total transfiguration of the body developed. The rapid appearance of the unique symptoms compels us to believe that throughout her illness there were active biologic forces, which caused these changes. You must have been impressed with the numerous symptoms originating from different systems of the body. The chronologic sequence of these symptoms has been read to you, but for the purpose of clarification it may be worth while to consider the systems or organs from which these symptoms arose. The findings in this patient indicate that changes occurred in (1) the cutaneous and subcutaneous tissues, (2) the bones, particularly the spine, (3) the nervous system, (4) the heart and the vascular system, (5) the kidneys, (6) the voluntary muscles, (7) the genital organs and (8) various metabolic functions.

As far as the cutaneous and subcutaneous tissues are concerned, there were periodic swelling of the face and body, hypertrichosis of the face, body and arms, furunculosis, increase in the size of the face, hands, wrists and ankles, purple striae, rough dry skin with scars, a lipoma and suggestive male distribution of the pubic hair.

Arising from changes in the bones there were pains in the right upper quadrant, girdle pains, tenderness of the long bones, shortening of stature, kyphosis with tenderness of the eighth dorsal vertebra, a tender lumbar spine, compression of the vertebrae, irregular calcification and localized osteoporosis. There was a normal sella turcica.

As for the nervous system, there were headaches, blurring of vision and questionable homonymous hemianopia.

Changes in the heart and vascular system resulted in: (a) edema of the ankles, dyspnea and palpitation, pulmonary rales, mottling of the lung fields by x-ray, slight enlargement of the heart, distant heart sounds, gallop rhythm, electrocardiographic changes and an acute episode with cardiac collapse and (b) attacks of syncope, increased capillary fragility, telangiectasis, hemorrhages of the eyegrounds and a tortuous aorta.

In regard to the kidneys, if it is true that a stone was passed and that the pyelogram showed very small kidneys, there may have been certain changes in these organs. I should like, however, to emphasize the findings of normal pelves and calices.

Concerning the muscular system, there was generalized wasting.

As for the genital system, there were scanty menses; and it may be worth while to emphasize that the clitoris was normal.

Of the disturbances of metabolic functions, the most important and interesting was acute diabetes. The basal metabolism was minus 30, the blood calcium and phosphorus were normal, the phosphatase was slightly high and the cholesterol level was high.

I do not know, and I do not think anybody else knows, any extrinsic factor that could produce this combination of changes in the body. Whenever we find such widespread changes in the human body we naturally suspect the little organ that is so safely protected and deeply hidden and that, from a strategic position, can change the function and structure of so many organs; I mean, of course, the pituitary body. The question therefore is: *Are all the changes in this patient compatible with pituitary body disturbance?* I shall review the symptoms once more and comment on just that question. The swollen face and the body conformation, we know, fit into this dysfunction. Hypertrichosis and also furunculosis are apt to occur in pituitary body disturbance, owing to some peculiar change in the resistance of the body; and it is not uncommon for these patients to die of sepsis. Increased size of the face, hands, wrists and ankles fits also. Purple striae are not absolutely specific, but they belong *first of all* to pituitary dysfunction. The atypical distribution of the pubic hair belongs there indirectly. Decalcification of the bone we know occurs in association with certain pituitary disturbances, and the changes described go very well with those conditions. Headaches and blurring of vision are also entirely compatible. As to the remarkable changes in the heart and vascular system, I think they belong there, too. As a matter of fact, since the time of Hirehard, even before we recognized the syndrome of basophilism, we have known that patients with acromegaly not infrequently exhibited a huge heart, with myocardial failure, and the cause of death was cardiac. Therefore, the dyspnea, the enlarged heart, the distant sounds, the gallop rhythm and the electrocardiographic findings belong directly or indirectly to disturbance of the pituitary body. Kidney stone has been described in association with certain pituitary dysfunctions. Muscles very frequently exhibit wasting, and irregular menses occur. The clitoris is normal, if, of course, there is no secondary ovarian tumor. How about the changes in metabolism? As far as diabetes is concerned, we know that in one group of patients with pituitary dysfunction there is production of a hor-

*Associate Professor of Medicine, Harvard Medical School, Assistant Director of Thorndike Memorial Laboratory, Boston City Hospital.

mone that is antagonistic to insulin, and, therefore, an acute diabetes may develop. This acute diabetes does not respond very well to insulin, and the severity of the diabetes at times may show fluctuation. The sudden appearance and subsequent practical disappearance of the disturbance of the carbohydrate metabolism is, however, more extreme in this case. As far as the chemical findings are concerned, the bony changes are the type one finds in pituitary disturbances. That is to say, in spite of the marked decalcification, there is not necessarily a change in the calcium or the phosphorus level in the blood.

We can answer the question asked by stating that *every finding in this patient is entirely compatible with certain dysfunctions of the anterior portion of the pituitary.* If, however, someone should ask me if it is absolutely pathognomonic, with no possibility of anything else, I would have to be more careful. In other words, I cannot make an absolutely flat-footed diagnosis of primary basophilism here, because we know at times *certain primary tumors, such as adenoma and carcinoma of the cortex of the adrenal, can show almost all the changes presented by this patient,* and at times even *ovarian tumors* can produce them.

In the *differential diagnosis* between these three types of tumors, the following features in this case should be mentioned. Hypertrichosis is more apt to occur, I believe, in disturbances of primary adrenal tumors than in primary pituitary tumors. The clitoris should be normal in pituitary tumors; in certain adrenal tumors it may be enlarged, and it is markedly enlarged in ovarian tumors. The red striations are more characteristic, as I have said, and are more apt to occur in pituitary tumors; they rarely occur in adrenal, and never in ovarian tumors. The osteoporosis present in this patient is particularly common in pituitary tumors, very rarely occurs in adrenal tumors, and is never present in ovarian tumors. The normal pyelogram is somewhat against a primary tumor of the adrenal gland. The dry skin is characteristic of pituitary gland tumors, also of adrenal and ovarian tumors. Therefore, taking all these facts into consideration it is my opinion that the most plausible diagnosis is *dysfunction of the pituitary body.*

One more point—why did this patient die? I must again be careful because the evidence that we have is inadequate to make a flat-footed diagnosis. The patient had a sudden attack of precordial pain radiating up to the throat, became pale and there were certain electrocardiographic findings which were described as being entirely compatible with or suggesting coronary thrombosis. The diagnosis of coronary thrombosis is very tempting, but I would like to resist that temptation because I have never seen coronary thrombosis in this type of heart. I have seen such an attack of pain occurring in patients with myocardial dilatation, unclassified myocarditis, causing similar electrocardiographic findings. I might mention that in the pituitary type of cardiac disturbance one can get electrocardiographic changes. Unless one knows the state of affairs the day before, one has no justification for diagnosing thrombosis. Finally, there is one more possibility. It is farfetched, but I have to mention it. This patient had furunculosis, and therefore she must have had a persistent subacute bacteremia. In furunculosis it is not uncommon to find cardiac abscess, and very rarely these cardiac abscesses rupture; I believe there is a mere possibility that this may have happened in this patient. In conclusion, my diagnosis in this case is primary difficulty or pituitary dysfunction of the pars anterior (basophilism, probably basophilic adenoma). There may also be secondary hyperplasia or enlargement of the adrenal cortex. The secondary manifestations are as follows: (1) decalcification, osteoporosis of the bones, kyphosis and compression of the vertebrae, (2) diabetes mellitus of the "anti-insulin hypophyseal hormone" type, (3) cardiac hypertrophy and "myocarditis" with circulatory failure of pituitary origin; increased capillary fragility; attacks of syncope, (4) arteriosclerotic plaques of the aorta, (5) nephrosclerosis with small kidneys and (6) furunculosis with sepsis. There was, possibly, myocardial abscess with perforation (?) and terminal circulatory collapse.

Clinical Discussion

Dr. Fuller Albright: I am very much relieved that Dr. Weiss's conclusion agreed thoroughly with what we thought clinically, even if Dr. Mallory will not check us.

There are two things I would like to discuss. One is the diabetes. I do not think the record has really given the correct impression. She had a very mild diabetes when we first saw her; in fact it was two or three days before it was discovered. She was treated with large doses of insulin, up to 90 units, with no effect on the diabetes, and we finally stopped giving insulin. Because of the marked fluctuation in the dosage, one reading the record has obtained the impression that the degree of diabetes fluctuated; the fact is that the insulin had very little effect. The other point concerns whether there was or was not a disorder in the calcium metabolism. It is true that calcium and phosphorus values in the serum were normal, but the calcium excretion in the urine was markedly elevated, up to 500 milligrams in a three-day period, whereas the normal value is about 200

milligrams. There was, therefore, an increased excretion of calcium in the urine, and the renal stone was fairly good evidence of this disturbance. As far as I know none of the other cases of this syndrome have had stone. She is the first one. When Cushing first described this disease he was under the impression, I believe, that the calcium disturbance was secondary to a parathyroid disturbance. However, I think this conclusion is no longer warranted. In the first place, the metabolic changes are not those of hyperparathyroidism; in the second place, most of the cases have not shown any parathyroid pathology; and, in the third place, the bone changes are not like those seen in parathyroid disease. Whereas in hyperparathyroidism with bone disease one gets generalized bone changes, in this syndrome almost all the changes are in the spine and pelvis as opposed to skull and long bones. These changes are much more like the type of decalcification you see in senile osteoporosis. Histologically, also, the pathology is that of osteoporosis and not of osteitis fibrosa. One can always differentiate these two types by the phosphatase. In osteitis fibrosa the phosphatase is high in the serum, and in senile osteoporosis it is normal or only slightly elevated. It was interesting that the x-ray treatment over the pituitary did not affect the calcium secretion, a fact that was against a pituitary disturbance, as has been shown by Dr. Sosman at the Peter Bent Brigham Hospital.

Clinical Diagnoses

Pituitary basophile adenoma.
Coronary thrombosis?
Bronchopneumonia.
Terminal cutaneous infections.

Dr. Soma Weiss's Diagnoses

Pituitary dysfunction, presumably basophilism.
Secondary hyperplasia of the adrenal cortex.
Diabetes mellitus (hypophyseal type).
Osteoporosis.
Cardiac hypertrophy.
Arteriosclerosis.
Nephrosclerosis.
Furunculosis with sepsis.

Anatomic Diagnoses

Adrenal cortical cell carcinoma with metastases.
Pulmonary embolus.
Pyelonephritis, left.
Nephrosclerosis, minimal.
Osteoporosis.
Pancreatic cyst, small.
Furunculosis.
Abscess of the left buttock.
Operative scar: Cholecystectomy.

Pathological Discussion

Dr. Tracy B. Mallory: Dr. Weiss has made such a very convincing case for pituitary disease that I almost wonder if my imagination did not carry me away at the autopsy table. We found, however, a rather large malignant tumor of the left adrenal with metastases all up and down the retroperitoneal glands. There was a metastasis in the lung, a rather small one. The pituitary was somewhat small, grossly, and as far as we have been able to make out from the study of many sections it is negative histologically. The parathyroids were normal histologically.

Dr. Weiss was wise in resisting the temptation of making a diagnosis of coronary thrombosis because the coronary arteries were wide and perfectly negative, and the heart as far as we could tell was absolutely normal. We found nothing at autopsy to explain the attack of substernal pain, unless it was due to a small pulmonary embolus found in the artery to the left lower lobe of the lung. The kidneys were rather different in size; one weighed only 100 grams, the other about 200. The larger kidney showed a fairly marked pyelonephritis. Both kidneys showed minimal changes of the vascular type, not a very significant degree of nephrosclerosis. The osteoporosis, as you can see from this postmortem x-ray of the spine, was of severe grade and is evidenced not only by the "fishbone vertebrae" but by the herniae of the discs into the bodies of the vertebrae.

The histology is characteristic of an adrenal cortical cell tumor. I think there is no question that that was the primary underlying cause of practically every symptom she had, with the exception of the pyelonephritis.

Dr. John H. Talbott: Now that the diagnosis has been made I might add that I did sodium determinations because we thought she might have had an adrenal tumor and because there is a reciprocal action in adrenal tumors and adrenal atrophy where you may find elevation of the serum sodium; but there was no elevation in this instance.

Dr. Mallory: I think there was no possible way in which the diagnosis could have been made, though if the patient had lived a few weeks longer, the pulmonary metastasis might have grown large enough to be seen by x-ray.

CASE 23012

Presentation of Case

An eight year old native schoolgirl was admitted complaining of abdominal pain.

Seven months before coming to the hospital the patient developed acute rheumatic fever and remained in a hospital until five days prior to her entry here. She recovered satisfactorily

from her acute illness and remained perfectly well while at home until the day of admission. About twelve hours before entry she complained of intermittent pain in the right lower quadrant. This became progressively more severe, and a few hours later a physician ordered the application of an ice bag and the administration of an enema. This was followed promptly by vomiting, and the pain became considerably relieved. Later it recurred with greater intensity and was still intermittent in character.

Physical examination showed a well-developed and nourished girl (fig. 1) looking older than her given age. The heart was enlarged to the left and presystolic and systolic murmurs were heard in the mitral area. These were both transmitted to the axilla. The blood pressure was 110/70. The lungs were clear. Tenderness and slight spasm were elicited in the right lower abdomen. Peristaltic sounds were normal. Perineal examination showed a patent vaginal orifice and a heavy growth of pubic hair. The clitoris was enlarged. Rectal examination showed tenderness in both vaults. A large mass was felt in the pelvis, but no details were noted concerning its characteristics.

The temperature was 100°, the pulse 130. The respirations were 20.

Examination of the urine showed a slight trace of albumin but was otherwise negative. The blood showed a white cell count of 26,000.

Shortly after entry a laparotomy was performed.

Differential Diagnosis

Dr. John Rock: There are a few very important details in this history. The patient was only eight years old. She had rheumatic heart disease. She had been in a hospital for seven months until five days before entry here. She had a fairly clear cut picture of appendicitis. Her blood pressure was 110. There were signs of precocity, as indicated by the growth of pubic hair and the enlarged clitoris. There was a mass in the pelvis, and her white cell count was 26,000. If possible we would like to find one condition that would account for all these facts. We have the picture of acute appendicitis, of a mass in the pelvis and of maturity in a girl of eight years. We might be able to do that if we assume the presence of some ovarian tumor, or a tumor in the pelvis plus a disturbance of some one of the endocrin glands that would account for precocity. A disturbance of the other endocrin glands, anterior pituitary or adrenal, might allow maturity and still not disturb the form of the ovaries. There is no evidence of gross endocrinologic disturbance, which would be expected if there were a tumor of the anterior pituitary or the pineal or adrenal gland. Moreover, these tumors are rare explanations of precocity in a young girl. This is precocious puberty; the instances of maturity below eight years of age are comparatively few and few of these are normal. There is usually some definite pathology to account for them. The fact that she had rheumatic heart disease and maturity raises the question of bacterial endocarditis and salpingitis. That has never been seen so far as I know in such young people. But bacterial endocarditis following scarlet fever or tonsillitis may cause salpingitis in adults. That would account for the picture of appendicitis and the mass, but would not account for the puberty. If one must have a diagnosis to cover both of these, the picture of appendicitis and puberty, then one must have a tumor of the ovary, I think, and, furthermore, some disturbance of that tumor, such as a twisted pedicle. There is no note made here of menstruation.

Dr. Tracy B. Mallory: There had been none.

Dr. Rock: If there had been menstruation, a diagnosis of tumor of the ovary would have been a little surer, but in the absence of menstruation the diagnosis is not ruled out. Certain tumors of the ovary, which could cause puberty, do not necessarily cause menstruation though feminizing tumors may have amenorrhea of the persistent follicular type.

The working diagnosis in this patient, I should think, must be acute appendicitis with some incidental disturbance in the pelvis. The patient must be operated on with a question of acute appendicitis. Any such patient, especially any young female, requires exploration. She may have salpingitis and one would be sorry if he explored, but if there is a possibility of appendicitis one must explore. She might have hematometra which would account for amenorrhea. This is a far cry, too, and presupposes a distant endocrine tumor, which we have ruled out. She may have a twisted cyst in the presence of normal ovaries. This presupposes normal puberty in a girl of eight, and that is not likely. The probability is that puberty was due to an embryonal tumor of the ovary, and that she had appendicitis; or, in the absence of appendicitis, that something had happened to the tumor.

Dr. Mallory: At operation the appendix was normal. There were two tumor masses. One ovary was greatly enlarged and its pedicle twisted. Another tumor mass was found in the posterior culdesac, not specifically recognized as ovary, and was resected. The second tumor was not infarcted.

Dr. Rock: The solid tumors of the ovary that could account for puberty are few. There is fibroid, but that again presupposes normal puberty, which, as I have said, is rare in a girl eight years old. The most common one is a tumor of the granulosal cell type and the next a teratoma. The fact that there were two large tumors, one of them twisted, makes the diagnosis

of teratoma a little more likely, but the granulosal cell tumors are not uncommonly bilateral. I should say the girl probably had a twisted pedicle granulosal cell tumor. The other solid tumors, disgerminoma and arrhenoblastoma, are very uncommon in young children: furthermore, disgerminoma never directs the secondary sex characteristics and the arrhenoblastoma must necessarily lead to masculinization. The only evidence of masculinization is the enlarged clitoris and that is not emphasized as being particularly large.

DR. MALLORY: We can show you a picture that will allow you to form your own opinion (fig. 3).

DR. ROCK: That is a fairly large one. With

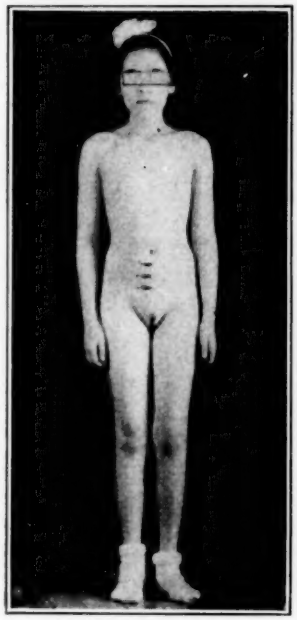

FIGURE 1.

FIGURE 2.

FIGURE 3.

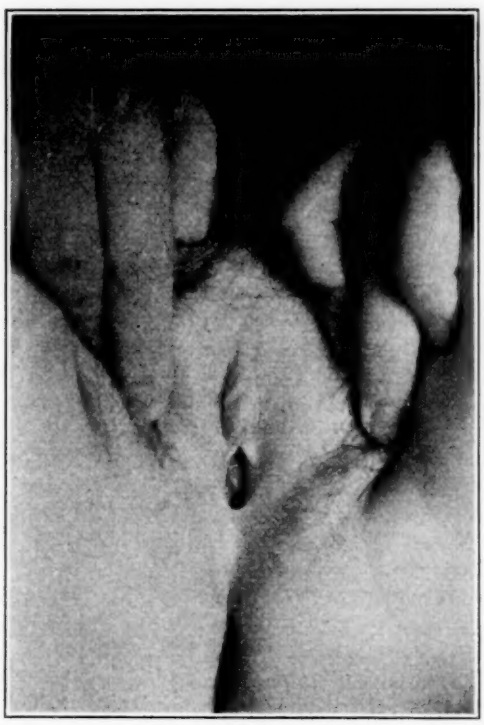

FIGURE 4.

this degree of precocity in the growth of hair one would expect, if the hormone were working in a purely feminine direction, a smaller clitoris and menstruation. As I have said, the granulosal cell tumor does not necessarily cause menstruation but usually does cause a sporadic flow. The general configuration of the patient, the absence of breast development, the failure of fat deposition, and so forth, makes one think a little more of the arrhenoblastoma type of tumor. However, I will stick to granulosal cell tumor on statistics, because arrhenoblastoma is exceedingly rare in young people and the granulosal cell is not.

DR. LANGDON PARSONS: The mention of dermoid interested me a bit because I saw a case at the Peter Bent Brigham in which hirsutism was part of the picture. The patient had a tumor removed twenty years before. There was a history of increased hirsutism, but no mention of the clitoris. The chief lead was one of masculinization. They took a flat plate and found a tumor containing teeth. She had bilateral dermoid.

PREOPERATIVE DIAGNOSIS

Acute appendicitis.

DR. JOHN ROCK'S DIAGNOSES

Acute appendicitis?
Twisted pedicle of embryonal tumor of ovary, probably granulosal cell type, possibly arrhenoblastoma.

ANATOMIC DIAGNOSES

Embryonal carcinoma of the ovaries.
Seminoma?
Arrhenoblastoma?
Infarction of the right tube and ovary.

PATHOLOGICAL DISCUSSION

DR. TRACY B. MALLORY: The diagnosis in this case, it seems to me, has to be determined by balancing as carefully as possible the histologic features versus the physiologic features. The girl was brought back to the hospital six months following the removal of the tumor and this is her picture at that time (fig. 2). She has put on a considerable amount of weight, and her distribution of fat has become very much more the feminine type, the enlargement of the thighs in particular. The breasts are now noticeably prominent, whereas they were perfectly flat before, and there is definite regression in the size of the clitoris (fig. 4), so that the physiologic evidence in this case is strongly in favor of a tumor with a masculinizing hormone.

From the histologic point of view it is much more difficult to be dogmatic. The tumor is obviously of the epithelial type. The epithelial cells are arranged for the most part in rather large alveolar masses. A great many of the cells are round, lie almost free in these masses, and approach very closely the type that is usually called the seminoma. There are other parts of the tumor, however, where the cells are much smaller, basophilic, tend to run in cords two cells wide and approach more closely what have been described as the typical characteristics of arrhenoblastoma. From the slides alone, however, I think it would be impossible to make a flat-footed diagnosis of arrhenoblastoma. In fact it is more suggestive of seminoma.

It seems to me that in the ovary it is not unreasonable to expect that tumors will differentiate more than one way as, of course, one of the most characteristic tumors, the teratoma, does; and it certainly has been our experience that our present correlation between morphology and function in these ovarian tumors is very poor. A tumor, for instance, can have the physiologic characteristics of a granulosal cell cancer yet show any morphologic appearance from that of a highly malignant carcinoma through an epithelial adenoma into a pretty ordinary fibroma. Yet the physiologic function may be the same.

This is a photomicrograph that shows a rather characteristic area in the tumor, especially over here on the left where you see some of these big, round, almost free-lying cells that are very characteristic of what you see in seminoma. Only an occasional cord of the smaller cells is present. The histology does not help in deciding which type of tumor we are dealing with. It seems to me we have to consider either that this is a disgerminoma that had a masculinizing effect or an atypical arrhenoblastoma.

DR. PARSONS: Were both ovaries removed?

DR. LYONS: I thought definitely that both were removed.

DR. PARSONS: The reason I asked was that I noticed in the picture that six months later there was development of the breast. It has been shown that in rats the growth of the breast is independent of ovarian function in the first part of life. I wonder if that applies here.

DR. MALLORY: I think it might. Have you any experience with that in sterilized children, Dr. Rock?

DR. ROCK: No; but I question the statement, which Dr. Parsons quoted, that the growth of the breasts is independent of the ovaries, because we know that the ovaries do function even from the beginning and direct all the secondary sex characteristics. I would suppose in this case that there was some ovarian tissue left to account for the development of the breast.

DR. MALLORY: I am afraid we shall have to wait a few years to be sure of that.

DR. ALBRIGHT: It is very interesting that after operation the prolan became positive, which is evidence that the ovaries function before puberty.

DR. MALLORY: Do you think she has ovarian tissue left?

DR. ALBRIGHT: I do not know. She had one episode of vaginal bleeding. It would be a little in favor of some remaining ovarian tissue.

The New England
Journal of Medicine

SUCCESSOR TO
THE BOSTON MEDICAL AND SURGICAL JOURNAL

Established in 1828

Published by THE MASSACHUSETTS MEDICAL SOCIETY under the jurisdiction of the

COMMITTEE ON PUBLICATIONS

R. I. LEE, M.D., *Chairman* R. M. SMITH, M.D.
R. B. OSGOOD, M.D. F. H. LAHEY, M.D.
J. P. O'HARE, M.D.

EDITORIAL BOARD

JOHN P. SUTHERLAND, M.D. STEPHEN RUSHMORE, M.D.
GEORGE R. MINOT, M.D. HANS ZINSSER, M.D.
FRANK H. LAHEY, M.D. BENJAMIN WHITE, PH.D.
SHIELDS WARREN, M.D. HENRY R. VIETS, M.D.
GEORGE L. TOBEY, JR., M.D. ROBERT M. GREEN, M.D.
C. GUY LANE, M.D. CHARLES C. LUND, M.D.
WILLIAM A. ROGERS, M.D. JOHN F. FULTON, M.D.
DWIGHT O'HARA, M.D. A. WARREN STEARNS, M.D.

ASSOCIATE EDITORS

JOSEPH GARLAND, M.D. GEORGE G. SMITH, M.D.
WILLIAM B. BREED, M.D.

WALTER P. BOWERS, M.D., *Editor Emeritus*
ROBERT N. NYE, M.D., *Managing Editor*
CLARA D. DAVIES, *Assistant Editor*

THE NEW HAMPSHIRE MEDICAL SOCIETY
PUBLICATION COMMITTEE

CARLETON R. METCALF, M.D. HENRY H. AMSDEN, M.D.
WARREN H. BUTTERFIELD, M.D.

THE VERMONT STATE MEDICAL SOCIETY
PUBLICATION COMMITTEE

A. B. SOULE, JR., M.D. P. A. GODDARD, M.D.
H. E. UPTON, M.D.

SUBSCRIPTION TERMS: *$6.00 per year in advance, postage paid for the United States, Canada $7.04 per year, $8.52 per year for all foreign countries belonging to the Postal Union.*

Material for early publication should be received not later than noon on Saturday. Orders for reprints must be sent to the Journal office, 8 Fenway.

The Journal does not hold itself responsible for statements made by any contributor.

Communications should be addressed to The New England Journal of Medicine, 8 Fenway, Boston, Mass.

EDITOR EMERITUS

WALTER PRENTICE BOWERS, known best to most of us for the last fifteen years as managing editor of the *Journal*, has devoted over sixty years of a long and honorable life to medicine and to public service. Although his time for a few years after graduation from the Harvard Medical School in 1879 was occupied only with the practice of medicine and surgery, it was not long before his willingness and ability for public service became recognized and appreciated.

In his native town of Clinton, he served on the Board of Selectmen, was Town Meeting Moderator, and for a time directed the Board of Health. He has been a trustee of the Clinton Hospital since its incorporation in 1889. In 1894, at the time of its creation, he was appointed a member of the Massachusetts Board of Registration in Medicine, and was its executive secretary from 1913 until 1921. He served as president of the Massachusetts Medical Society in 1913 and 1914, and has been managing editor of *The Boston Medical and Surgical Journal*, now *The New England Journal of Medicine*, since 1921.

During this entire period his achievements have been characterized by his honesty, industry, self-sacrifice and ability. There has been for him no monetary reward that can even approach the service he has rendered; it is gratifying to know, however, that his accomplishments have been recognized by his alma mater, and that Harvard University conferred upon him the honorary degree of Master of Arts in 1935.

We learned with regret that his resignation as managing editor of this *Journal* had been accepted by the Committee on Publications of the Massachusetts Medical Society, and that his services in this capacity must come to an end. Fortunately this does not mean the severing of all connections, but merely relief from the more arduous administrative duties. As editor emeritus and as a member of the Editorial Board ex officio, he will still give to the *Journal* and those connected with it the benefits of his wise counsel, his extensive knowledge and his kindly nature.

The Editorial Board and the office staff of the *Journal* extend to Dr. Bowers their best wishes for all the happiness and good fortune that he deserves during this well-earned period of lessened activity, and we feel sure that this expression of good will is shared by the members of the Massachusetts Medical Society and the other societies supporting the *Journal*, and by his many additional friends.

THE INCIDENCE OF TRICHINOSIS

IN 1842, there appeared in the *Boston Medical and Surgical Journal* a report of the first case of trichinosis in America by Henry Ingersoll Bowditch of Boston. Although attention has been called since then to many epidemics occurring in this country, trichinosis is still regarded as a rare infectious disease. In 1935 Drake, Hawkes and Warren[1] described the largest recorded epidemic in the United States and the first epidemic in the State of Maine. Fifty-six persons were known to have been infected from one source of trichinous pork. It is probable that most of the cases of trichinosis do not occur in epidemic form. By means of better diagnostic aids and postmortem studies, it has been shown that sporadic cases and milder forms of the disease often escape diagnosis.

One of the most successful methods of determining the true incidence of trichinosis was that introduced by Queen.[2] Artificially digesting the diaphragms from 344 necropsies in Rochester, New York, he found 17.5 per cent contained *Trichinella spiralis!* None of these cases had a history of trichinosis. A second series of diaphragms studied in Boston revealed

27.6 per cent parasitized. A similar study made in San Francisco by McNaught and Anderson[3] showed 24 per cent of 200 diaphragms infected. Again, none of the cases had a definite history of trichinosis. Riley and Scheifley[4] of Minneapolis examined biopsied specimens of diaphragms. In one series of 117 diaphragms, 17.9 per cent were positive, and in a second series of 50 diaphragms, 20 per cent showed trichinella larvae. These observations show that in four widely separated communities in this country about 20 per cent of the cases studied were unknowingly infected with *Trichinella spiralis*. We may conclude from this that a larger proportion of the country's population has or has had trichinosis than is realized.

Clinical studies by Spink and Augustine[5] have revealed that many cases of trichinosis are not diagnosed correctly because of the variable symptomatology. The usual textbook picture of the disease is not always present. It was found that the first clinical clue to the correct diagnosis in many individuals was the presence of an eosinophilia. In this issue of the *Journal* Spink describes tests that have proved of great value in the diagnosis of doubtful cases.

Trichinosis is a preventable disease. Present methods of government inspection of meat do not insure the ultimate consumer against the danger of infection. *Control of the disease depends upon the thorough cooking of all pork products before they are eaten.*

REFERENCES

1. Drake, E. H.; Hawkes, R. S., and Warren, M.: An epidemic of trichinosis in Maine. J. A. M. A. **105**:1340 (Oct.) 1935.
2. Queen, F. B.: The prevalence of human infection with *Trichinella spiralis*. J. Parasitol. **18**:128 (Dec.) 1931.
3. McNaught, J. B., and Anderson, E. V.: The incidence of trichinosis in San Francisco. J. A. M. A. **107**:1446 (Oct.) 1936.
4. Riley, W. A., and Scheifley, C. H.: Trichinosis of man—a common infection. J. A. M. A. **102**:1217 (April) 1934.
5. Spink, W. W., and Augustine, D. L.: The diagnosis of trichinosis: with especial reference to skin and precipitin tests. J. A. M. A. **104**:1801 (May) 1935.

A SERIES OF CASE HISTORIES

BEGINNING with this issue of the *Journal* and each week subsequently there will be published a series of case histories on obstetrics and gynecology under the auspices of the Section of Obstetrics and Gynecology of the Massachusetts Medical Society.

The whole project seemed so important to the chairman and secretary of the Section and the amount of work entailed so great that a committee of seventeen members, chosen from every part of the State, has been established to assist the officers.

It is planned in these case histories to cover the entire field of obstetrics and gynecology and their complications. The cases will be actual and not hypothetical. The complication of bleeding is the first subject that will be illustrated, and all the case reports that will appear between now and the June meeting of the Section will be on this subject. These case histories will be continued for as long a time as seems reasonable.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

DUNCAN, CHRISTOPHER J. A.B., M.D. Tufts College Medical School, 1928. Junior Visiting Surgeon, Gynecological and Obstetrical Service, Boston City Hospital. Assistant Surgeon to Outpatients, Free Hospital for Women. Assistant Obstetrician, Massachusetts General Hospital. Junior Obstetrician, St. Elizabeth's Hospital and Evangeline Booth Hospital. Assistant in Gynecology, Harvard Medical School. Assistant in Obstetrics, Tufts College Medical School. Address: 1101 Beacon Street, Brookline, Mass.

DOYLE, JOSEPH B. A.B., M.D. Harvard Medical School, 1932. Assistant to Outpatients, Boston City Hospital. Address: 20 Commonwealth Avenue, Boston, Mass. Their subject is "Cesarean Section. A Ten-Year Study of 703 Cases at the Boston City Hospital." Page 1.

SPINK, WESLEY W. A.B., M.D. Harvard Medical School, 1932. Resident Physician, Thorndike Memorial Laboratory, Boston City Hospital. Assistant in Medicine, Harvard Medical School. His subject is "Trichinella Antigen: Further Observations on Its Use in the Diagnosis of Trichinosis." Page 5. Address: Thorndike Memorial Laboratory, Boston City Hospital.

TILLOTSON, KENNETH J. M.Sc., M.D. University of Vermont College of Medicine, 1921. Psychiatrist-in-Chief, McLean Hospital. Psychiatrist to the Massachusetts General Hospital. Instructor in Psychiatry, Harvard Medical School. Psychiatrist in the Department of Hygiene, Harvard University. His subject is "Psychiatric Work in the Hygiene Department of Harvard University." Page 9. Address: P. O. Box 8, Waverley, Mass.

THURMON, FRANCIS M. B.S., M.D. Harvard Medical School, 1926. Assistant Professor of Dermatology, Tufts College Medical School. Physician-in-Chief, Clinic of Dermatology and Syphilology, The Boston Dispensary. Dermatologist, Boston Floating Hospital. Address: 520 Commonwealth Avenue, Boston, Mass.

CHAIMSON, HARRY. M.D. St. Louis College of Physicians and Surgeons, 1921. Assistant in Dermatology and Assistant Surgeon, Genito-

Urinary Clinic, The Boston Dispensary. Address: 491 Commonwealth Avenue, Boston, Mass. Their subject is "Gentian Violet Treatment of Leg Ulcers: Preliminary Report." Page 11.

DALRYMPLE, SIDNEY C. M.D. Bowdoin Medical School, 1917. Diploma in Bacteriology, University of London, 1935. Associate Professor of Pathology and Bacteriology, Tufts College Medical School. Pathologist, Newton Hospital. Visiting Pathologist, Waltham Hospital. His subject is "Suggestions for the Bacteriology Laboratory of the Small Hospital." Page 15. Address: The Newton Hospital, Newton Lower Falls, Mass.

FINNEY, J. M. T. A.B., M.D. Harvard Medical School, 1889. LL.D., F.A.C.S. Professor of Surgery (Emeritus), Johns Hopkins University School of Medicine. His subject is "Religion in Medicine." Page 16. Address: 2947 St. Paul Street, Baltimore, Md.

PAINTER, CHARLES F. A.B., M.D. Harvard Medical School 1895. His subject is "Dr. Jacob Bigelow." Page 20. Address: 520 Commonwealth Avenue, Boston, Mass.

The Massachusetts Medical Society

SECTION OF OBSTETRICS AND GYNECOLOGY*

R. S. TITUS, M.D., *Chairman*
472 Commonwealth Ave., Boston, Mass.

ROY J. HEFFERNAN, M.D., *Secretary*
524 Commonwealth Ave., Boston, Mass.

CASE HISTORIES

NO. I. THREATENED MISCARRIAGE

Mrs. C. P. D., a white woman, 29 years old, was seen at home on the morning of March 18, 1930, complaining of having bled a little the previous night and having flowed a great deal that morning. She was about three and one-half months' pregnant. The amount of actual bleeding when seen was very slight, but the appearance of the bed linen showed that a very considerable amount of blood had been lost.

There was no family history of tuberculosis, diabetes, malignancy or hemorrhagic disease. Her past history was essentially negative. Her periods were regular, consistently twenty-four days apart. The last period occurred December 13, 1929. She had been seen several times in the office. Her pregnancy was complicated by a third degree of retroversion, which spontaneously righted itself. She had had one full-term child on August 6, 1928. This child, when about four and one-half months old, died suddenly while asleep. She had had a spontaneous complete miscarriage at two and one-half months in August, 1929.

On physical examination she was a tall, thin, normally developed woman, whose normal weight was about 95 pounds. Her teeth were well cared for. Her mucous membranes on the morning of March 18, 1930, were pale. Her lungs were normal and resonant throughout, and there were no rales. Her blood pressure was 90/70 with a pulse rate of 110. The abdomen was negative save for a symmetrical tumor palpable above the symphysis, in size consistent with a pregnancy of three and one-half months. The extremities were normal. There were no palpable glands. No vaginal examination was made. A diagnosis of threatened miscarriage was made, and she was removed to the hospital by ambulance. One-quarter grain of morphia was given.

A blood Wassermann was negative. Blood examination on reaching the hospital revealed a red blood cell count of 2,200,000 and a white blood cell count of 6,500.

Both the patient and her husband were advised of the probability of miscarriage. Upon arrival at the hospital there was no fresh bleeding, and, in view of her previous obstetric history, it was decided to make all possible efforts to save the baby. While it seemed more than likely that Mrs. D. would start to bleed again, it was deemed safe and advisable to leave her alone as long as she remained in the hospital, because, if bleeding should again occur, proper treatment could immediately be carried out without undue risk. There was no fresh bleeding after her arrival at the hospital. There was some dark discharge for two or three days.

There really was no question in this particular case of any differential diagnosis. She had been seen right through her pregnancy. It was known that the uterus was increasing normally in size. It was known that she had no fibroid, no cervical polyp, no cancer and no extrauterine pregnancy. The only condition that might have confused the diagnosis of a threatened miscarriage was a hydatidiform mole. The normal increase in the size of the uterus all during her pregnancy up to the time of the bleeding and the normal increase after the bleeding ceased were sufficient to rule out this condition. No quantitative Aschheim-Zondek test was done with the diagnosis of hydatidiform mole in question, because it was felt that the diagnosis of mole was ruled out and because of no continued bleeding.

Mrs. D. was kept in bed at the hospital for

*A series of selected case histories by members of the Section will be published weekly.
Comments and questions by subscribers are solicited and will be discussed by members of the Section.

three weeks. By this time it was evident that the uterus was still enlarging and was fully four months plus in size. At no time was vaginal examination made. A week later she was allowed to sit up and two days later was sent home by ambulance. Again, because of the importance to her of this baby, she was treated most conservatively. She was allowed up and about in her bedroom each day. She was not allowed downstairs until after eight months. Her urine and blood pressure remained normal throughout her entire pregnancy, the latter ranging from 104/70 to 110/60. On September 20, 1930, she was delivered of a male child weighing seven and one-half pounds. There was an area of degeneration about 2 inches square on the placenta, probably the site of separation when the bleeding occurred at three and one-half months.

When Mrs. D. was seen, there had been so much bleeding that the possibility of the pregnancy going on to term was considered nil. Conservatism in these cases, when bleeding has entirely ceased, will often result in a continuation of the pregnancy and delivery at term of a normal child.

MISCELLANY

THE TREATMENT OF DEMENTIA PRAECOX

Dr. Manfred Sakel of Vienna, the originator of the hypoglycemic treatment for dementia praecox, is visiting the United States and at present is living at the Murray Hill Hotel in New York City.

Upon the invitation of Dr. Frederick W. Parsons, Commissioner of the Department of Mental Hygiene in New York State, Dr. Sakel is holding a clinic at the Harlem Valley State Hospital, Wingdale, New York, to teach a group of selected physicians from the institutions in the Department the technic of this new form of therapy.

Dr. Parsons has authorized each State Hospital to send a physician to the Harlem Valley State Hospital for such instruction.

The course will cover a period of six weeks of intensive work.

ENTIRE FREEDOM FROM TUBERCULOSIS OF CATTLE IS UNITED STATES AIM

With the continued cooperation of public officials, veterinarians, livestock owners, and others who have aided in the aggressive fight against bovine tuberculosis, leaders in the work hope that eventually this disease will be entirely eradicated. In 43 states the prevalence of bovine tuberculosis has already been reduced to less than one-half of 1 per cent. These developments were the basis of an address by Dr. John R. Mohler, Chief of the U. S. Bureau of Animal Industry, at an Achievement Day Celebration at Harrisburg, Pa., December 16. The event celebrated federal recognition of Pennsylvania as a modified accredited area, signifying the reduction of bovine tuberculosis throughout the State to less than one-half of 1 per cent.

The campaign against tuberculosis in Pennsylvania, Dr. Mohler pointed out, has been noteworthy in several respects. The first herd test in the United States for the eradication of tuberculosis was conducted in Pennsylvania in 1892. Outstanding pioneer work against the same disease has been conducted in that State by five widely known scientists — Pearson, Ravenel, Gilliland, Marshall, and Munce. As an opportunity for continuing leadership in bovine tuberculosis eradication, Dr. Mohler pointed out the desirability of continued effort "with prospects of reducing the present small fraction of 1 per cent of bovine tuberculosis to the point of entire disappearance."

HEALTH OFFICERS' MONTHLY STATEMENT OF VENEREAL DISEASES REPORTED IN THE NEW ENGLAND STATES

OCTOBER, 1936

This statement is issued monthly for the information of health officers in order to furnish current data as to the prevalence of the venereal diseases. The following reports were received from State Health Officers. The figures are preliminary and subject to correction. It is hoped that this will stimulate more complete reporting of these diseases.

State	Syphilis		Gonorrhea	
	Cases Reported During Month	Monthly Case Rates per 10,000 Population	Cases Reported During Month	Monthly Case Rates per 10,000 Population
Connecticut	222	1.29	151	.88
Maine	24	.28	62	.73
Massachusetts	466	1.07	567	1.30
New Hampshire	17	.34	16	.32
Rhode Island	93	1.37	73	1.07
Vermont	—	—	—	—

Treasury Department—U. S. Public Health Service.

PATENT MEDICINES AND SEAFOODS GET SPECIAL ATTENTION IN FOOD AND DRUG REPORT

"It seems incredible that today medicines should be found in interstate commerce bearing claims for the treatment of cancer, tuberculosis and diabetes. Medical authorities do not recognize any cure for those conditions, and any medicine so offered is a fraud. Yet during the year 21 preparations so misbranded were found within the jurisdiction of the law."

In these words W. G. Campbell, Chief of the Food and Drug Administration, calls attention in his annual report to certain weaknesses in the people's defense against patent medicine frauds. This re-

port, just off the press, marks the thirtieth anniversary of the enactment of the Food and Drugs Act. It covers the administration's work in the enforcement of 6 acts of Congress. Foods and drugs are dealt with separately, foods from the standpoint of public health, offenses against commonly accepted ideas of cleanliness and soundness, and economic frauds upon the purchaser.

During the year the administration found illegal 2,683 samples from interstate shipments of foods and drugs. Of these, 2,092 were of foods and stock feeds and 591 medical and other drug preparations.

In discussing the patent medicine frauds, Mr. Campbell says that eleven seizures were made and fines totaling $2,561 were imposed in eleven criminal prosecutions. Following the comment on so-called "cures" for cancer, tuberculosis and diabetes, the report adds:

"Nor is this the whole picture. Claims for pneumonia, influenza, gallstones, rheumatism, Bright's disease, and venereal diseases, continue to be made on the labels of medicines that have no value whatever in the treatment of those conditions. The firms resorting to this sort of business find shelter, at least temporarily, in the requirement that the Government must prove fraud, and in the inadequate man-power of the Administration, which must cover the coast lines and State borders with a corps of inspectors numbering less than 100."—*Bulletin, Department of Agriculture.*

DR. GEORGE W. HOLMES HONORED

Dr. George W. Holmes, of the Massachusetts General Hospital, was honored December 28 at a dinner in observance of his sixtieth birthday and the twenty-fifth anniversary of his appointment as roentgenologist for the hospital.

During the dinner, which was given at the Harvard Club by his students and assistants, Dr. Holmes was presented with a special anniversary number of the *American Journal of Roentgenology* dedicated to him and made up entirely of contributions by his former students all over the country.

MAN CAN LIVE ON MEAT IF HE ONLY GETS ALL OF IT

Civilized methods of butchering meat are brought into the old scientific controversy over the possibility of man living on an exclusive meat diet in a discussion by the noted explorer, Dr. Vilhjalmur Stefansson, as reported in the journal, *Science.*

Guinea pigs fed only lean meat develop scurvy, but Dr. Stefansson and his companion, Karsten Andersen, lived for a year on an exclusive meat diet for experimental purposes without developing scurvy. The discrepancy is explained usually either on the ground that there is some difference between men and guinea pigs, or that the meat diet of the two explorers occasionally contained liver which is rich in scurvy-preventing vitamin C. Carnivorous men, such as Eskimos, who live chiefly on meat are thought to escape scurvy because they eat the liver and other vitamin-C containing organs as well as the lean meat.

Dr. Stefansson explains the scurvy-protection which carnivorous men have on the ground that the meat they eat contains a great deal of blood. This is also true of the meat eaten by northern explorers or others who live by hunting.

"But our butchers are careful to bleed animals," Dr. Stefansson points out. "A given weight of animal food as consumed by an Eskimo therefore contains a considerable proportion of an ingredient nearly absent from butcher's meat."—*Science News Letter*, October 31, 1936.

CORRESPONDENCE

OBJECTION TO THE ANNUAL REGISTRATION OF PHYSICIANS

December 22, 1936.

Editor, *New England Journal of Medicine,*

According to your editorial of December 17, 1936, the Board of Registration in Medicine is again advocating the annual registration of physicians. It is said that this bill differs from that of last year, making the fee one dollar instead of two. This must be a bargain year for the doctors. If the bill had been passed last year, we would continue to be paying two dollars annually for the rest of our days. Now the Board finds that it can accomplish the same ends with one dollar derived from each doctor instead of two! And if the Board continues to wait another year for the passage of such a bill, then it might discover that one dollar will be a dollar too much, and that the bill, a regulation too many.

We physicians are continually striving to mitigate other people's pains and aches, while for ourselves we appear to add another load of discomfort. We are told that with the annual registration of doctors, it will be comparatively easy for the authorities to "jump" on unlicensed practitioners of medicine. It is an easy task right now, if one cares to "go and get them". The fact is that there are not many who practice medicine illegally, without being discovered.

There are all kinds of laws, regulations, and what not today, and in fact we have too many of them for our own good. The Legislature is continually passing new laws, and we are so sick of them that the public is endeavoring to have the House of Representatives and the State Senate meet every other year. With all the laws against gambling, it still flourishes. Laws do not prevent crime, but proper enforcement does.

It is an easy matter to ascertain if a certain individual has the authority to practice medicine. Just ask the Board of Registration in Medicine. Just because "nearly twenty states" have passed such a law is no reason why this Commonwealth ought to pass one. Twenty-eight or more states have *not* passed such a law, and we should abide by the majority.

Regulations require that every person who drives an automobile must be licensed annually, but this mandate does not prevent many persons from driving automobiles minus licenses. About a year ago, the newspapers carried a story to the effect that . . . thousands of persons are practicing medicine illegally in this Commonwealth. . . . If then it is "known" that thousands of persons are practicing medicine illegally in this Commonwealth, and it has accordingly been "known" for a year, why then bother with the passage of this bill to discover who these unlicensed persons are when they have, according to the press, been counted. And in order to have been counted, their names undoubtedly must have been known. And if their names are known, and their places of business are disclosed, then why wait for the passage of this bill? How many lay persons care about what particular method of treatment a physician uses? Patients inquire concerning the reputation of the physician, an attainment which will never be recorded if this bill passes.

Your editorial states: "If the physician dies, only by chance does the Board learn of his cessation of practice." In such a case, even if this law were in effect, the Board would not know if a physician died, because neither a dead doctor, nor a doctor who moved out of the state, nor one who became too old to renew his annual license, nor one who was so wealthy that he refused to have his renewed, would seek the annual registration. And to consider that people really desire to know more about the qualifications of their physicians is worthy of note. If this were a fact, then there would not be . . . thousands of persons practicing medicine illegally in this Commonwealth. . . . Why place the burden upon the shoulders of the honest, law-abiding, registered physician when one is out to "get" the unlicensed practitioners? Why inconvenience us?

MAX BAFF, M.D.

15 Shamrock Street,
Worcester, Mass.

CURE OF VARICOSE VEINS

December 19, 1936.

Editor, *New England Journal of Medicine*,

I should like to congratulate Doctors Whitney and Consales on their management of patients in the Vein Clinic at the Boston Dispensary, as reported in the issue of December 3, 1936. Particularly interesting was the statement that "35 per cent of all varicosities can be cured by injection treatment alone." This was based on an "end-result" analysis of 113 cases treated by injection two or more years before the study was made.

At the Vascular Clinic, of the Beth Israel Hospital, we have studied cases treated by injection three to six years previously, and found, *in over 90 per cent*, anatomical evidences of considerable recurrence and recanalization. Recurrence of symptoms, however, was less striking. We therefore suggest caution in the use of the word "*cure*" in connection with treatment of varicose veins by any method or combination of methods, regardless of the perfection of the obliteration at the conclusion of treatment.

We are in agreement with Doctors Whitney and Consales that the best present-day treatment for the majority of cases of varicose veins is a combination of surgery and injection.

I should like to comment on a letter in your issue of December 17, 1936, by Dr. Edward A. Edwards, who refers to his principle "that the short saphenous need not be ligated no matter how large the varices of that vein were, in distinction to varices of the great saphenous vein." In my experience, recanalization or recurrence of varicosities of the short saphenous vein definitely occurs (less frequently and more slowly, to be sure, than in varicosities of the great saphenous system); for this reason, ligation and retrograde injection of the short saphenous vein is performed in selected cases in the Vascular Clinic of the Beth Israel Hospital and the Peripheral Circulatory Clinic of the Massachusetts General Hospital.

The treatment of varicose veins is in a state of flux: during the past five years the pendulum of therapy has been swinging slowly away from the simple injection method back toward the principles so clearly expounded by Dr. John Homans some sixteen years ago. A middle ground is being approached and only careful, prolonged end-result studies will tell us just how good or bad are the methods of 1936.

Yours truly,

JOHN B. SEARS, M.D.

416 Marlboro Street,
Boston, Massachusetts.

NAUSEA CAUSED BY MORPHINE

December 31, 1936.

Editor, *New England Journal of Medicine*,

Morphine is a drug that is quite toxic for some people. Nervous, high-strung women are liable to react badly to it. It is common to hear women say they cannot take morphine. Morphine, contrary to the general opinion of physicians, does not cause a cessation of peristalsis, but just the reverse, spasm and hypermotility. In some cases, when the reaction is severe, spasm may predominate and for a short time there may be a tonic contraction of the bowel, probably most intense at the pylorus. While this condition exists no sounds, or very few, are heard with the stethoscope, peristalsis being almost eliminated. Later, active peristalsis is resumed.

It has been difficult for the writer to understand why there should be nausea and vomiting if the stomach and intestine are quieted by morphine. Vomiting depends on spasm and some degree of reverse peristalsis. If these two factors are absent there can be no vomiting.

In some conditions it is quite important to give

morphine, and, when the patient is unable to tolerate it, one is at a loss to find a satisfactory substitute. In the writer's experience, phenobarbital given by mouth or sodium luminal given hypodermically is the ideal drug to overcome the irritating effect of morphine. If given by mouth it should be given three to four hours before morphine administration. If sodium luminal is given hypodermically, grains 2 should be given two hours before. The nauseating effect of the morphine may not be completely abolished but it will be considerably lessened.

NEIL C. STEVENS, M.D.

Walpole, New Hampshire.

RECENT DEATH

FRANCIS DENNIS DONOGHUE, M.D.

As the *Journal* goes to press, word has come that Francis Dennis Donoghue, M.D., aged 65 years and one of the leading surgeons and experts in industrial medicine in this country, died January 4, at the Peter Bent Brigham Hospital.

Born in Georgetown, he graduated from Dummer Academy in 1891 and from Harvard Medical School in 1894. First affiliated with Tufts College as a surgeon in the dispensary, he then became instructor in clinical and operative surgery, which position he held for fifteen years. He was surgeon at the Boston Dispensary and consulting surgeon at the Jordan Hospital in Plymouth.

Dr. Donoghue was appointed medical adviser to the Massachusetts Industrial Accident Board in 1912, when the Board was formed, and held that position until his death. He was recognized as an international authority in industrial accidents and diseases. In 1925 he was appointed by the President to represent the United States at the International Conference on Accidents at Amsterdam. As a delegate appointed by the President, he attended all succeeding congresses and became prominent in the organization. He was permanent vice-president from the United States and a member of the Council.

He is survived by his wife and two married daughters.

NOTICES

FIFTH INTERNATIONAL CONGRESS OF HOSPITALS

At the Congress in Rome, May, 1935, the International Hospital Association decided to hold the 1937 sessions in Paris. Previous sessions had been held in Atlantic City, Vienna and Knocke Sur Mer, Belgium. The meetings will occur during the International Exposition which will group the exhibits and products of more than fifty countries under the general caption, Art and Technology.

Dr. Malcolm T. MacEachern, of the American College of Surgeons, is vice-president of the International Hospital Association. The Federation of the Hospital Unions of France has been designated officially by the Ministry of Public Health to cooperate with the International Hospital Association, and the program and arrangements for the Congress are now being completed.

The meetings will be held at Paris from July 6 to 11, 1937, and will include visits to some of the large hospitals, the Cancer Institute, and the principal agencies engaged in Public Health Work. At the time of the Congress, scientific and pleasure tours will be conducted in various parts of France.

Persons attending the Congress will be granted important reductions in rates when traveling on French and foreign railroads. The Exposition authorities also will give special privileges to visitors.

The Chairman of the Committee on Arrangements for the Congress is M. Albert Chenevier who is secretary-general of the Department of Public Assistance in Paris. Further information may be obtained from M. Chenevier, No. 3 Avenue Victoria, Paris IV, France.

MEDICAL CLINIC AT THE PETER BENT BRIGHAM HOSPITAL

At 3:30 p. m., on Thursday, January 14, in the Amphitheater of the Peter Bent Brigham Hospital, Dr. C. Sidney Burwell, Research Professor of Clinical Medicine and Dean, Harvard Medical School and Physician, Peter Bent Brigham Hospital, will give a medical clinic. To it are cordially invited practitioners and medical students.

CLINICS FOR CRIPPLED CHILDREN IN MASSACHUSETTS, UNDER THE PROVISIONS OF THE SOCIAL SECURITY ACT

Clinic	Date	Orthopedic Consultant
Brockton	January 14	Dr. George W. Van Gorder.
Gardner	January 12	Dr. Mark H. Rogers.
Greenfield	January 8	Dr. Harry R. Wheat.
Pittsfield	January 18	Dr. Francis A. Slowick.
Springfield	January 20	Dr. Garry deN. Hough, Jr.
Worcester	January 15	Dr. John W. O'Meara.
Lowell	January 30	Dr. W. Russell MacAusland.
Hyannis	January 26	Dr. Paul Morton.
Fall River	January 25	Dr. Eugene McCarthy.

THE BOSTON CITY HOSPITAL

MONTHLY CONFERENCE OF CLINICAL PATHOLOGY

A monthly conference of clinical pathology will be held at the Hospital on Wednesday, January 13, at 12 o'clock noon, in the Pathological Amphitheater.

JOSEPH E. HALLISEY, M.D.,
Secretary, Medical Staff.

REMOVAL

WILLIAM S. ALTMAN, M.D., announces the removal of his office to 32 Spear Street, Quincy, Massachusetts.

NATHAN L. FINEBERG, M.D., announces the removal of his office to 475 Commonwealth Avenue, Boston.

REPORTS AND NOTICES OF MEETINGS

SUFFOLK DISTRICT MEDICAL SOCIETY

The Suffolk District Medical Society met at the Boston Medical Library Wednesday evening, Nov. 18, 1936, Dr. Conrad Wesselhoeft presiding. The first paper of the evening was presented by Dr. M. J. Shear of the United States Public Health Service on the subject "Hydrocarbons and Cancer." Since the original observations made in 1915 that repeated applications of coal tar would produce epitheliomatous tumors, numerous investigators have devoted their energies to the problem of the relation between the constituents of coal tar and neoplastic diseases. In 1930 Kennaway and his collaborators were successful in producing malignant tumors with a pure chemical compound, 1-, 2-, 5-, 6-dibenzanthracene, a substance which had been prepared independently by Claude and Feiser. Many carcinogenic oils have been found to have characteristic fluorescence with certain types of light, a fact which has enabled synthetic chemists to elaborate compounds which, theoretically, should produce similar fluorescent spectra for use in carcinogenic research. Many of these new synthetic compounds have been found to be very active carcinogenic agents.

Using resistant strains of mice Dr. Shear has been able to produce malignant tumors in 100 per cent of the animals treated with dibenzanthracene. The hydrocarbon has been recovered from the tumor site 6 to 8 months after the injection, although once the tumor has been produced the hydrocarbon is no longer essential for the maintenance of growth, as is shown by the fact that it is not present in tumor transplants. Such transplants have been made through five or six generations of animals, with the maintenance of malignant properties. Transplants can be made to take in 100 per cent of animals of pure strains, but animals of impure strains must first be treated with trypan blue to break down their resistance before takes can be produced in every animal. The exact role of trypan blue in these animals is not known.

In Dr. Shear's laboratory the carcinogenic hydrocarbons are dissolved in a cholesterol solution, made into small pellets, and imbedded in the tissues to be studied. Microscopic examination of tissues adjacent to these pellets has begun to shed light on the so-called "precancerous" changes. Quantitative analyses of the pellets removed after the production of tumors have shown that only infinitesimal amounts of the carcinogenic substances have been removed, indicating their great potency.

Methylcholanthrene, originally prepared from desoxycholic acid, a normal constituent of bile, and later synthesized by Fieser and his collaborators, has been found to be the most active carcinogenic agent yet studied. All of the animals treated with this substance developed malignant tumors within 4 months after the injection of a very small quantity. Interestingly enough, an isomer of this compound had no carcinogenic activity whatever.

The latent period between the time of injection of the carcinogenic agent and the development of the malignant changes in the adjacent tissues varies with the compound employed, in some instances amounting to 10 months, and in others to only 1½ months. The smaller the quantity of hydrocarbon employed the longer the latent period. Many different varieties of malignant growths have been produced: carcinoma simplex, adenocarcinoma, squamous cell carcinoma, mixed carcinoma and sarcoma, sarcoma and rhabdomyosarcoma being among those reported.

Dr. Shear emphasized the fact that compounds other than hydrocarbons have been found carcinogenic, citing various anilin dyes and sterols as examples. The sex hormones, which are structurally related to the benzanthracene compounds, may play a significant role in carcinogenesis in the body.

The exact mechanism by which these various compounds cause the development of neoplastic changes is not understood. It is possible that some carcinogenic substances may be made within the body from preexisting compounds of somewhat similar structure (e.g., cholanthrene from desoxycholic acid), although this thesis has never been proved, and there are some workers who doubt its probability.

The second paper of the evening was presented by Dr. J. C. Aub on the subject of "Cancer Research. Recent Advances in Our Knowledge of Cancer." Dr. Aub emphasized the fact that although certain of the carcinogenic compounds discussed by Dr. Shear are closely related structurally to normal constituents of the human body, and can be synthesized from them by relatively simple chemical procedures in the laboratory there is no evidence that they are produced in the body.

There is some relationship between the sex hormones and the carcinogenic substances, some of the latter being estrogenic in large doses.

Lacassagne, working with a highly potent preparation of the estrogenic hormone, has been able to produce neoplastic disease in rats. Injections of massive doses of this estrogenic substance into females from the time of birth caused marked proliferation and cornification of the vaginal epithelium, endometrial hyperplasia and invasion of the myometrium, and cystic changes in the breasts with papillary proliferation of the parenchymal epithelium. Similar injections into male animals caused marked hypertrophy of the prostate and extreme proliferation of the ductal tissues in the breasts. Using a strain of mice in which the female was normally highly susceptible to breast cancer but in which the male never developed such tumors, Lacassagne was able to produce mammary cancer in 100 per cent of both male and female animals by prolonged injections of estrogenic hormone. When cancer resistant strains were used tumors could be produced only with difficulty, and some strains were absolutely resistant, even though prolonged injections of massive doses

were made. Two factors must be operating in these animals: the hormone stimulates growth of the mammary tissues, and allows the operation of the hereditary traits of the individual. The added stimulation of the hormone accelerated and increased the development of tumors in those animals possessing an inherent tendency to breast tumors, while such stimulation was inadequate to break down the resistance of the nonsusceptible strains.

Allen and Gardner demonstrated that estrin may produce other sorts of tumors. They injected ketoestrin benzoate in solution in oil, with resultant development of sarcoma at the site of injection, showing a similarity between the properties of this substance and the carcinogenic hydrocarbon compounds.

Several filtrable viruses have been discovered which are able to produce tumors. They apparently enter the tissue cells and cause their proliferation. Since the virus proliferates with the cells it increases in amount and enters still more cells, with resultant production of more growth. The blood serum of animals infected with these viruses may become resistant to them, and antibodies can be demonstrated in vitro, but since the active virus is present intracellularly the body fluids are unable to neutralize it, and it survives and causes the continuation of cellular proliferation.

Rous has demonstrated the presence of a virus in the metastases of a malignant papilloma of the rabbit. He has suggested the possibility that certain human tumors may be caused by a filtrable virus, although no such etiology has yet been demonstrated.

Dr. Aub pointed out that there is only one fundamental difference between a tumor cell and a normal cell; the normal cell stops its growth processes at the normal time, while the tumor cell grows unrestrainedly. The tumor cells produce all the enzymes and secretions produced by normal cells, e.g., the osteoblasts in osteogenic sarcoma produce phosphatase, and the carcinomatous cells of the pancreatic islet carcinoma produce insulin.

It is important to remember that the methods under study at present are methods of producing neoplasia. The mechanism of such production and methods of prevention are unknown at present. The importance of the fact that results obtained by animal experimentation cannot be transferred directly to human problems must also be borne in mind.

Dr. J. W. Schereschewsky in discussing the papers questioned whether toxic substances can be formed in the body with resultant production of tumors. He pointed out that cholesterol, which is the parent substance for the bile acids and the sex hormones, is synthesized in the body in fair amounts, and that it is possible that it may undergo chemical changes with the resultant production of a carcinogenic substance. Severe exposure of the skin to light causes the accumulation of cholesterol in the epidermis and it is a well-known fact that exposed portions of the skin are more prone to develop tumors than the protected parts. Radiation of cholesterol causes it to emanate light for a time after the discontinuation of the radiation, a fact which may be important in connection with tumor formation in exposed skin. Dr. Schereschewsky stated that he believed more progress would be made in the prevention of malignant disease than in the cure of such disease after its appearance.

Dr. R. B. Greenough spoke of the importance of the concept of precancerous conditions, and stated that the majority of tumors causing the high mortality rate for cancer arise from a precancerous condition, which if detected could be eradicated before the appearance of true malignancy. He suggested that abnormalities in the structure of certain hormones might be responsible for the production of certain abnormal reactions, e.g., an abnormality of the estrogenic hormone producing abnormal stimulation of the breast with subsequent development of carcinoma.

BOSTON PATHOLOGICAL SOCIETY

The Boston Pathological Society met at the Children's Hospital, Tuesday evening, December 1, 1936, with Dr. J. Beach Hazard presiding. The meeting, however, was given under the auspices of the Pathological Department of the New England Deaconess and Palmer Memorial Hospitals with Drs. Shields Warren and Allen Marshak giving the papers of the evening.

The first paper, "Chromosome Structure in Relation to Radiation," was given by Dr. Marshak. He described the chromosome in the resting state as containing two threads wound about each other. Some cytologists, however, believe that there is but a single thread coiled on itself. Normally, in the prophase of mitosis, the threads thicken and may be seen in pairs coiled about each other. In the metaphase, the threads split longitudinally to form four. During the anaphase, the chromosomes split again longitudinally, each pair of threads going with a respective daughter cell. These phases were beautifully illustrated by lantern slides depicting high-power magnifications of the pea and bean cells.

The effect of radiation by rather massive doses of x-ray and radium was then demonstrated. The sections were prepared 20 to 30 minutes after the radiation was applied. The chromosomes then showed, while in mitosis, interadherence of these fine threadlike structures with tiny globules of chromatin material forming. During the anaphase, the longitudinal splitting of the chromosomes was then either partially or completely prevented. An occasional chromosome was often incompletely pulled to the poles and left near the line of division to be later fragmented in the periphery of the cell. This process would result in an abnormal chromosome content of the young cells.

Dr. Warren gave the second paper of the evening entitled "The Effect of Radiation on the Skin." He spoke briefly of the general effects of radiation on

the tissues, both normal and carcinomatous. The cells show vacuolization of the cytoplasm and the nucleus; the cells generally look "sick". Interadherence of the chromosomes and atypical mitotic figures are found generally. It appears that the greatest effect of radiation is found in the mitotic phase of the cell; especially is this true in tumors. In one strain of rats having a tumor which shows rather constantly twenty mitoses per 1,000 cells, the tumor had but one mitosis per 1,000 cells 7 hours following radiation.

The skin after radiation shows rather characteristic and constant changes. It becomes atrophic, smooth and shiny and may break down and ulcerate. This was illustrated admirably by pictures of a young surgeon who had been accustomed to reduce fractures under the fluoroscope without protecting his hands. The fingers, more particularly the thumbs and index fingers, showed severe radiation burns, with loss of the nail, ulceration and atrophy. Progress of the lesion will necessitate amputation of the fingers involved.

Sections of the skin 10 days after 3,200 r units of radiation show beginning desquamation of the epithelium, although no regular line of demarcation can be seen between the cutis and underlying tissue. The basement membrane is lost and there is a "furry" extension of the cells downward into the corium. Mitoses are seen not only in the basal layer, but in all layers of the epithelium. The elastic fibers degenerate. A more immediate effect on the elastic fibers is seen 4 days following radiation as evidenced by their variation in density, and formation of little nodules, and coiling. This process is mainly responsible for the characteristic smoothness and shininess of the skin. Five weeks after radiation the epithelium is greatly thinned and shows irregular downgrowths into semihyalinized corium. Eight months later marked crusting of the keratinized layer of the skin is seen.

The blood vessels and the connective tissue show marked changes as well. A patient, who had had 4,000 milligram hours of radiation for a basal cell carcinoma of the ear, died 4 days thereafter. The capillaries of the adjacent brain were thrombosed, although there was no effect on the glia or on the pyramidal cells except in areas with softening. A later effect is seen in the organization of thrombi in the larger arteries and attempts at recanalization. The elastic layer in these vessels is also degenerated. A characteristic finding in the skin, as well as in the deeper tissues, is the presence of thin-walled dilated blood spaces, telangiectases, perhaps as an effort to compensate for thrombosis in the other vessels. Still later there is complete hyalinization of the vessel with cellular infiltration in the outer wall. A radiation ulcer of the skin will show, besides the superficial inflammation, dense underlying connective tissue with a paucity of blood vessels.

Not only in the skin, but also in tumor tissue are similar reactions found. In carcinoma of the cervix, cells are found with vacuolated cytoplasm and vacuolated nuclei. The underlying less differentiated cells are more profoundly affected than are the cells containing keratohyalin. The reactions of the connective tissue and blood vessels occur here just as in the skin.

Transplants of healthy epithelium to previously radiated areas on the rabbit's ear do not take and soon completely desquamate. The corium shows, as before, dense relatively bloodless corium with thrombosed vessels. The epithelium of an irradiated area, if removed soon after the radiation and transplanted to a denuded healthy surface, will grow, but not as a normal transplant. Rather there will be a hyperkeratosis of the cutis with irregular downgrowths into the subcutaneous tissue. The cells show large nuclei with very prominent nucleoli. The epithelium of an irradiated area will not take if removed more than about 30 hours following the radiation.

Following Dr. Warren's address, the meeting was adjourned to the Pathology Laboratory where, besides an array of refreshments, there was set up a battery of microscopes revealing sections illustrative of the speakers' papers.

THE MIDDLESEX SOUTH DISTRICT MEDICAL SOCIETY

This Society met at the Middlesex County Sanatorium on November 25, 1936. The meeting was called to order by Dr. Sumner Remick, the President.

Dr. Cole B. Gibson, Superintendent and Medical Director of the Meriden State Tuberculosis Sanatorium, who came from Connecticut to address the audience of 150 Fellows, was introduced. The title of his talk was "The Sanatorium and the Community."

Dr. Gibson summarized the changes that had occurred in the treatment of tuberculosis during the past 30 years. He stated that over 30 years ago there were 200 deaths per 100,000 population from tuberculosis, and then gave estimates of the cases of tuberculosis in the United States and the number of sanatoria.

Concerning the death rate from tuberculosis, the lowest occurred where the most beds for the treatment of tuberculosis were available. The accepted standard is one sanatorium bed for each tuberculosis death. Dr. Gibson stated that, in Massachusetts during the last 3 years, there had been a reduction in the death rate from 86 per 100,000 to 48 per 100,000 population. He spoke about the relation of the sanatorium to the patient with respect to treatment and educational value, and described the various types of medical care and opportunities for research which the sanatoria offered. Following this, he described the relation of the physician to the sanatorium and the relation of the institution to the community. In this respect, Dr. Gibson said that the sanatorium offered a number of opportunities, namely, (1) the segregation and treatment of the tuberculous sick of the community, (2) activity

extended to the education of friends and the family, (3) the dissemination of information to the public through civic organizations, nurses, schools and similar institutions.

Dr. Gibson closed his most interesting and instructive paper in the following manner:

"As I understand it, it will be expected that in many instances the sanatorium will do the testing, take the x-rays, make the physical examination, and will make appropriate plans for the care of the positive cases. Certainly such a scheme will continue to find cases earlier, get them under treatment sooner, and result in still further lowering of the death rate.

"The sanatorium today, then, is one of the refined instruments of modern civilization. Like our modern highways, which are designed for convenience, safety, and ease of travel from point to point, over what previously might have been rugged and dangerous terrain, the modern sanatorium affords to a community convenient, safe, and scientific means for treating tuberculosis and promotes for the community a continual reduction in death rate by improving the road bed of diagnosis, is constantly eliminating the dangerous curves, behind which are hidden the contacts and patients with unrecognized early disease, by education and case-finding surveys and is providing speedier transportation to regained and maintained health by smoothing and improving the road surface of treatment."

ALEXANDER A. LEVI, M.D., *Secretary.*

CARNEY HOSPITAL

MONTHLY MEETING OF THE OUT-PATIENT STAFF

Monthly Meeting of the Out-Patient Staff of Carney Hospital will be held at 11:30 Tuesday, January 12. The speaker will be Dr. Louis E. Phaneuf and his subject "Prophylaxis, Diagnosis and Treatment of Carcinoma Uteri."

W. J. MACDONALD, M.D., *Secretary.*

WILLIAM HARVEY SOCIETY

The next meeting of the William Harvey Society will be held Friday, January 15, in the Auditorium of the Beth Israel Hospital, Boston, at 8:00 p. m.

PROGRAM

Speaker: Siegfried J. Thannhauser, Associate Professor of Medicine, Tufts College Medical School.

Subject: The Development of Our Knowledge of Metabolism.

Chairman: Dr. Cadis Phipps, Professor of Medicine, Tufts College Medical School.

GREATER BOSTON MEDICAL SOCIETY

The next meeting will be held on Tuesday, January 12, at 8:30 p. m., at the Beth Israel Hospital Auditorium.

Speaker: Charles R. Austrian, M.D., Professor of Medicine at Johns Hopkins University School of Medicine, Baltimore.

Subject: Bronchiectasis.

Discussion: Frederick T. Lord, M.D., and Richard H. Overholt, M.D.

H. A. KONTOFF, M.D., *President.*
D. B. STEARNS, M.D., *Secretary.*

THE NORFOLK DISTRICT MEDICAL SOCIETY

A regular meeting of the society will be held at the Peter Bent Brigham Hospital Tuesday, January 19, 1937, at 8:00 p. m. Tel. LON. 5260. Please note that the date of meeting has been advanced from the last Tuesday of the month.

Business: 8:00 p. m.

Communications: 8:15 p. m.

Demonstration of an Interesting Patient. Dr. Henry A. Christian.

Adhesive Pericarditis: Some Clinical and Laboratory Aspects of Its Problems. Dr. C. Sidney Burwell.

Contribution from the Department of Roentgenology. Dr. Merrill C. Sosman.

Some Surgical Aspects of Peptic Ulcer. Dr. Robert Zollinger.

Toxic Goitre. Dr. Elliott C. Cutler.

Discussion.

Collation.

FRANK S. CRUICKSHANK, M.D., *Secretary.*
1247 Beacon Street, Brookline.

THE SOUTH END MEDICAL CLUB

The next regular meeting of the South End Medical Club will be held at the headquarters of the Boston Tuberculosis Association, 554 Columbus Avenue, Boston, Tuesday, January 19, 1937, at 12 noon. The speaker will be Soma Weiss, M.D., Associate Professor of Medicine, Harvard Medical School; Director, Second and Fourth Medical Services (Harvard), Boston City Hospital. His subject will be "Syncope, Collapse and Shock." All physicians are cordially invited to attend. The usual luncheon will be served at 1 o'clock.

NEW ENGLAND HEART ASSOCIATION

The next meeting of the New England Heart Association will be held at the Peter Bent Brigham Hospital, Monday, January 11, 1937, at 8:15 p. m.

PROGRAM

1. Three Clinical Case Records and Pathological Findings.—Dr. Samuel A. Levine.
2. Electrocardiographic Studies of Lead IV, Using Nine Chest Positions.—Dr. A. W. Contratto.
3. Electrocardiographic Studies of Autopsied Cases of Congenital Heart Disease.—Dr. Maurice Schnitker.
4. Studies on Venous Pressure.—Dr. C. Sidney Burwell.
5. The Circulatory Adjustments in Arteriovenous Fistula.—Dr. J. A. Kennedy.

All members of the New England Heart Association and interested physicians are invited to attend.

JAMES M. FAULKNER, M.D., *Secretary.*

SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, JANUARY 11, 1937

Monday, January 11—

*8:15 p. m. New England Heart Association. Peter Bent Brigham Hospital.

Tuesday, January 12—

*9 a. m. - 10 a. m. Boston Dispensary, 25 Bennet Street, Boston. Gastro-Intestinal Clinic. Dr. K. S. Andrews.

8:30 p. m. Greater Boston Medical Society. Beth Israel Hospital Auditorium, Boston.

Wednesday, January 13—

*9 a. m. - 10 a. m. Boston Dispensary, 25 Bennet Street, Boston. Hospital Case Presentation. Dr. S. J. Thannhauser.

12 m. Boston City Hospital, Monthly Conference of Clinical Pathology. Pathological Amphitheater.

†12 m. Clinicopathological Conference. Children's Hospital Amphitheater.

4 p. m. - 5 p. m. Surgical Pathological Conference. Dr. Cutler and Dr. Wolbach, Peter Bent Brigham Hospital.

Thursday, January 14—

*8:30 - 9:30 a. m. Exchange visit, Surgical and Orthopedic Staffs of the Peter Bent Brigham and the Children's Hospitals, held this week at The Children's Hospital.

*9 a. m. - 10 a. m. Boston Dispensary, 25 Bennet Street, Boston. Urography and the Diagnosis of Diseases of the Upper Urinary Tract. Dr. H. A. Chamberlin.

*3:30 p. m. Medical Clinic at the Peter Bent Brigham Hospital. Dr. C. Sidney Burwell.

Friday, January 15—

*9 a. m. - 10 a. m. Boston Dispensary, 25 Bennet Street, Boston. Carcinoma of the Colon and Rectum. Dr. Frank H. Lahey.

12 m. - 1 p. m. Boston Society for the Advancement of Gastroenterology. Boston City Hospital (Cheever Amphitheater).

8 p. m. William Harvey Society. Beth Israel Hospital Auditorium, Boston.

Saturday, January 16—

*9 a. m - 10 a. m. Boston Dispensary, 25 Bennet Street, Boston. Hospital Case Presentation. Dr. S. J. Thannhauser.

*10 a. m. - 12 m. Staff Rounds at the Peter Bent Brigham Hospital. Conducted by Dr. Henry A. Christian.

Sunday, January 17—

4 p. m. Free public lecture at the Harvard Medical School, Building D, Longwood Avenue, Boston. Blood Pressure—Low and High. Dr. Soma Weiss.

---

*Open to the medical profession.
†Open to Fellows of the Massachusetts Medical Society.

January 7—Faulkner Hospital Clinical Meeting, 5 p. m.

January 7—Joint Meeting of the Boston Council of Social Agencies and the Boston Health League. See page 1259, issue of December 24.

January 8—Massachusetts Memorial Hospitals, luncheon meeting of Surgical Section. 82 E. Concord Street, Boston, at 12 noon.

January 11—New England Heart Association. See page 41.

January 12—Greater Boston Medical Society. See page 41.

January 12—Carney Hospital, monthly meeting of the Out-Patient Staff. See page 41.

January 13—Boston City Hospital, Monthly Conference of Clinical Pathology. See page 37.

January 14—Medical Clinic at the Peter Bent Brigham Hospital. See page 37.

January 14—Pentucket Association of Physicians. Hotel Bartlett, 95 Main Street, Haverhill, at 8:30 p. m.

January 15—William Harvey Society. See page 41.

January 15—Boston Society for the Advancement of Gastroenterology. See page 1145, issue of December 10.

January 19—The South End Medical Club. See page 41.

January 20—Illustrated Lecture at the Robert B. Brigham Hospital. See page 1256, issue of December 24.

February 3—American Social Hygiene Association. See page 1186, issue of December 17.

February 25, 26, 27—The New England Hospital Association. Hotel Statler, Boston.

March 30 - April 2—First International Conference on Fever Therapy. Postponement notice. See page 52, issue of July 2.

April 21-24—American Society for Experimental Pathology. See page 1075, issue of May 21.

July 6-11—Fifth International Congress of Hospitals. See page 37.

October 25-29—American College of Surgeons. Chicago, Illinois.

DISTRICT MEDICAL SOCIETIES

FRANKLIN DISTRICT MEDICAL SOCIETY

Will meet at the Weldon in Greenfield at 11 a. m. the second Tuesdays of January, March and May.

CHARLES MOLINE, M.D., Secretary.
Sunderland.

MIDDLESEX EAST DISTRICT MEDICAL SOCIETY

January 13—Bear Hill Golf Club, Stoneham.

March 16—Danvers State Hospital, Danvers.

May 11—Bear Hill Golf Club, Stoneham.

KENNETH L. MACLACHLAN, M.D., Secretary.
1 Bellevue Avenue, Melrose.

NORFOLK DISTRICT MEDICAL SOCIETY

January 19—See page 41.

February 23—Time, place and details of program to be announced.

March 30—8:15 p. m. New England Deaconess Hospital. A Symposium on Diabetes entitled "A Survey of the Diabetic Work of the George F. Baker Clinic in the New England Deaconess Hospital." Communications and Case Presentations by the Staff. Drs. Elliott P. Joslin, Howard F. Root, Priscilla White, Alexander Marble and Allen P. Joslin.

May—Annual Meeting. Details to be announced.

Note: The Censors will meet for the examination of candidates on the first Thursday of May, 1937. Fee of $10.00 is payable at the time of examination. Application blanks may be obtained by writing the Secretary, furnishing name, address and name of school of graduation in medicine. Application must be made at least three weeks prior to date of examination. Candidates whose applications are on file will receive proper notices.

FRANK S. CRUICKSHANK, M.D., Secretary.
1247 Beacon Street, Brookline.

PLYMOUTH DISTRICT MEDICAL SOCIETY

January 21—11 a. m. Bridgewater State Farm.

March 18—11 a. m. Brockton Hospital.

April 15—Annual Meeting. 11 a. m. Ducy Hospital.

May 20—11 a. m. Lakeville State Sanatorium.

FRED F. WEINER, M.D., Secretary.
231 Main Street, Brockton.

SUFFOLK DISTRICT MEDICAL SOCIETY

January 27—Boston Medical Library. 8:15 p. m. Joint Meeting with the Boston Medical Library. "Anthropology." Dr. Carleton S. Coon.

March 31—Boston Medical Library. 8:15 p. m. "Social Insurance—It Affects the Medical Profession." Dr. Charles E. Mongan. Discussion: Dr. Channing Frothingham.

April 28—Annual Meeting. Boston Medical Library. 8:15 p. m. "Problems in Surgical Diagnosis." Dr. Howard M. Clute.

CONRAD WESSELHOEFT, M.D., President,
CHARLES C. LUND, M.D., Secretary.

WORCESTER DISTRICT MEDICAL SOCIETY

January 13—Worcester City Hospital, Worcester, Mass. 6:15 p. m.: Dinner—complimentary by the hospital. 7:30 p. m.: Business session and scientific program.

February 10—Worcester State Hospital, Worcester, Mass. 6:15 p. m.: Dinner—complimentary by the hospital. 7:30 p. m.: Business session and scientific program.

March 10—The Memorial Hospital, Worcester, Mass. 6:15 p. m.: Dinner—complimentary by the hospital. 7:30 p. m.: Business session and scientific program.

April 14—Worcester Hahnemann Hospital, Worcester, Mass. 6:15 p. m.: Dinner—complimentary by the hospital. 7:30 p. m.: Business session and scientific program.

May 6—At 4:30 in the rooms of the Worcester Medical Library, Inc., at 34 Elm Street, Worcester, will be held the spring meeting of the Board of Censors.

Wednesday Afternoon and Evening, May 12—Annual Meeting. Time and place for this meeting will be announced in an early spring issue of the Journal.

ERWIN C. MILLER, M.D., Secretary.
27 Elm Street, Worcester.

WORCESTER NORTH DISTRICT MEDICAL SOCIETY

January 27—Meeting at the Leominster Hospital, 4:30 p. m.